

# The American Statistician

*Publication of the American Statistical Association*

University Microfilms  
313 North First Street  
Ann Arbor, Michigan  
A/Exch

DECEMBER, 1959

Volume 13, No. 5

\$1.50 per year

35 cents per copy

THE PRESIDENT'S COLUMN	1
NEWS	2
INTERNATIONAL STATISTICAL ACTIVITIES	7
FEDERAL STATISTICAL ACTIVITIES	9
GOVERNMENT OF CANADA STATISTICAL ACTIVITIES	13
CONTENT OF THE 1959 U.S.S.R. CENSUS OF POPULATION <i>By Morris B. Ullman</i>	14
QUESTIONS AND ANSWERS <i>Edited by Ernest Rubin</i> The Three Minute Mile	19
HIAWATHA DESIGNS AN EXPERIMENT <i>By Maurice G. Kendall</i>	23
CONSTRUCTING SIMPLE CORRELATION PROBLEMS WITH PREDETERMINED ANSWERS <i>By Bruce Edwards</i>	25
REPORT OF THE COMMITTEE ON PUBLICATIONS POLICY ON THE RESULTS OF THE PUBLICATIONS QUESTIONNAIRE	29
NEWS ABOUT MEMBERS	38
CHAPTER NOTES	39

## CHAPTER PRESIDENTS AND SECRETARIES

- ALBANY**—Herbert L. Bryan, Director of Research and Stat., New York State Dept. of Correction, 39 Columbia Street, Albany, New York; **Marjorie McGillicuddy**, 20 S. Allen Street, Albany, New York
- AUSTIN**—N. K. Woerner, Dept. of Public Safety, North Austin Station, Austin, Texas; **P. John Lymberopoulos**, Dept. of Business Services, University of Texas, Waggener Hall 415, Austin 12, Texas
- BOSTON**—Frederick Mosteller, Dept. of Statistics, Harvard University, 2 Divinity Ave., Rm. 311, Cambridge 38, Massachusetts; **John E. Alman**, Office of Statistical Service, Boston University, 725 Commonwealth Avenue, Boston 15, Mass.
- BUFFALO-NIAGARA** — **Richard N. Schmidt**, School of Business Adm., University of Buffalo, Buffalo, N.Y.; **Edward Dowd**, Roswell Park Memorial Institute, Buffalo, N.Y.
- CENTRAL INDIANA**—John R. Virts, 6143 Meadowlark Drive, Indianapolis 26, Indiana; **Robert A. Calhoun**, State Board of Health, Indianapolis, Indiana
- CENTRAL IOWA**—Robert J. Buchler, Statistical Laboratory, Iowa State College, Ames, Iowa; **Harvey N. Albond**, City Plan and Zoning Commission, Des Moines, Iowa.
- CENTRAL NEW JERSEY**—Mrs. Gladys W. Ellsworth, Research & Statistics, N. J. State Dept. Cons. & Economic Development, 520 E. State Street, Trenton 7, New Jersey; **Rueben Cohen**, Opinion Research Corp., North Harrison Street, Research Park, Princeton, New Jersey.
- CHICAGO**—A. Arthur Charous, Sears Roebuck & Co., Dept. 733C, General Merchandise Office, Chicago, Illinois; **Thomas D. Burke**, The Chicago Tribune, 435 N. Michigan Avenue, Chicago 11, Illinois.
- CINCINNATI**—Ram Gnanadesikan, Procter & Gamble Co., M. A. & R. Building, Ivorydale, Cincinnati 17, Ohio; **James T. Tumbusch**, General Electric Co., Testing Operation, F.P.L.D., Building 305, Cincinnati 15, Ohio
- CLEVELAND**—Charles H. Joseph, Jr., The World Publishing Co., 2231 W. 110th Street, Cleveland 2, Ohio; **Morris Darnovsky**, Market Research Services, 565 Hippodrome Bldg., Cleveland 15, Ohio
- COLORADO-WYOMING**—Pearl A. Van Natta, Child Research Council, School of Med., University of Colorado, 4200 E. 9th Avenue, Denver, Colorado; **Donald N. Livingston**, 1644 South Ivy Way, Denver 22, Colorado
- COLUMBUS**—Robert B. Miner, Dept. of Business Organization, Ohio State University, Columbus, Ohio; **Mikhail V. Condoide**, 188 West 10th Avenue, Columbus 1, Ohio
- CONNECTICUT**—Robert R. Kirkland, The Southern New England Telephone Co., 227 Church Street, New Haven 6, Connecticut; **Richard A. Greenberg**, Div. of Cancer & Other Chronic Diseases, Connecticut State Dept. of Health, Hartford, Connecticut
- DAYTON**—John E. Condon, 2813 Nacoma Place, Dayton 10, Ohio; **Theresa Fricke**, 1104 Creighton, Dayton 20, Ohio
- DETROIT**—Harry Sharp, Survey Research Center, University of Michigan, Ann Arbor, Michigan; **Miss Martha Seger**, 915 Sybil, Ann Arbor, Michigan
- HAWAII**—Gordon Frazier, Bank of Hawaii, Bishop & King Streets, Honolulu 13, Hawaii; **George H. Tokuyama**, 4005 Koko Drive, Honolulu 16, Hawaii
- UNIV. OF ILLINOIS**—Earl R. Swanson, Dept. of Agricultural Economics, University of Illinois, 305 Mumford Hall, Urbana, Illinois; **Henry F. Kaiser**, Bureau of Educational Research, 1007 S. Wright Street, Champaign, Illinois
- ITHACA**—C. R. Henderson, Department of Husbandry, Cornell University, Ithaca, New York; **Philip J. McCarthy**, New York State School of Industrial & Labor Relations, Cornell Univ., Ithaca, N. Y.
- MILWAUKEE**—James B. Schultz, 1112 East Howard Avenue, Milwaukee 7, Wisconsin; **Joseph W. McGee**, Dept. of Sociology, Marquette University, Milwaukee 3, Wisconsin
- MONTREAL**—Roger Lessard, Ecole Polytechnique, 1430 St. Denis, Montreal, Que., Canada; **James A. Coombs**, The Bell Telephone Co. of Canada, Montreal, Quebec, Canada.
- NEBRASKA**—Bernard Harris, Dept. of Mathematics, University of Nebraska, Lincoln 8, Nebraska; **James B. Hassler**, Dept. of Agricultural Economics, University of Nebraska, Lincoln, Nebraska
- NEW ORLEANS**—Roland Pertuit, 4871 Metropolitan Drive, New Orleans, Louisiana; **Elsie M. Watters**, School of Business Administration, Tulane University, New Orleans, Louisiana
- NEW YORK**—Robert E. Lewis, Economics Department, First National City Bank of N. Y., New York 15, N. Y.; **Sidney Sameth**, Union Health Center, 275 7th Avenue, New York, New York
- NORTH CAROLINA**—Bernard G. Greenberg, Dept. of Biostatistics, School of Public Health, University of North Carolina, Chapel Hill, North Carolina; **Robert J. Monroe**, Box 5457, State College Station, Raleigh, N. C.
- NORTH TEXAS**—Leroy Folks, 713 Sherwood, Richardson, Texas; **Paul D. Minton**, Computing Laboratory, Southern Methodist University, Dallas 22, Texas
- OKLAHOMA CITY**—William R. Wells, 4401 N. W. 50, Oklahoma City, Oklahoma; **Ellen L. Bryan**, 2505 Northwest 31st Street, Oklahoma City, Oklahoma
- PHILADELPHIA**—Benjamin J. Topping, National Analysts, Inc., 1015 Chestnut St., Philadelphia 7, Pa.; **Frederick N. Sass**, 6418 Lawnton Avenue, Philadelphia 26, Pa.
- PITTSBURGH**—Herbert Ginsburg, Materials Eng. Dept., Exper. Design & Stat. Analysis Sect., Westinghouse Electric Corp., E. Pittsburgh, Pennsylvania; **Isidore Altman**, Graduate School of Public Health, University of Pittsburgh, Pittsburgh 13, Pennsylvania.
- PUERTO RICO**—Alvin Mayne, 2169 Calle Gen Del Valle, Santurce, Puerto Rico; **Amadeo Francis**, Puerto Rico Economic Association, Santurce Building, 4th Floor, Santurce, Puerto Rico.
- ROCHESTER, N. Y.**—Lionel W. McKenzie, Chairman Dept. of Economics, University of Rochester, Rochester, New York; **A. Lester Lustik**, Rochester Gas & Electric Corp., 89 East Avenue, Rochester 4, New York
- SACRAMENTO**—Carl M. Frisen, 1570 Castec Drive, Sacramento 21, California; **Robert H. Gustafson**, Division of Research & Statistics, California State Bd. of Equalization, 1020 N Street, Sacramento, California
- SAN FRANCISCO**—Charles Roumasset, Bureau of Labor Statistics, 630 Sansome Street, San Francisco 11, California; **Ernest C. Olson**, Economics Dept., Bank of America, NT&SA, 300 Montgomery Street, San Francisco, California
- ST. LOUIS**—Donald E. Paul, c/o Laclede Gas Co., 1017 Olive Street, St. Louis 1, Missouri; **Edward G. Kreyling, Jr.**, St. Louis San Francisco Railway Co., 906 Olive Street, St. Louis 1, Missouri
- SOUTHERN CALIFORNIA**—Charles I. Landenberger, 965 Coronado Drive, Glendale 6, California; **Wm. V. Henderson**, Pacific Telephone Co., Rm. 916, 740 So. Olive Street, Los Angeles 55, California
- STATE COLLEGE, PA.**—William S. Ray, Associate Prof. of Psychology, Pennsylvania State University, University Park, Pennsylvania; **Judith Stoyke**, Pennsylvania State University, Boucke Bldg., University Park, Pennsylvania
- TULSA**—Lyndral E. Marcum, Blue Cross Blue Shield Hospital & Physician Service, P.O. Box 1738, Tulsa, Oklahoma; **Marshall E. Milligan**, Stanolind Oil and Gas Co., Tulsa, Oklahoma
- TWIN CITIES, MINN.**—J. A. MacDonald, Federal Reserve Bank, 73 South 5th Street, Minneapolis 2, Minnesota; **Mrs. Vida G. Hildyard**, Remington Rand Univac, Univac Park, St. Paul 16, Minnesota
- VIRGINIA**—John Griswold, U. S. Quartermaster Corps., Fort Lee, Virginia; **Rudolf J. Freund**, Dept. of Statistics, Virginia Polytechnic Institute, Blacksburg, Va.
- WASHINGTON, D. C.**—Seymour L. Wolfbein, U. S. Dept. of Labor, Washington 25, D. C.; **Edwin D. Goldfield**, Chief, Statistical Reports Division, Bureau of The Census, Washington 25, D. C.

A publication of the  
American Statistical Association

Founded 1839

EDITOR—Morris Hamburg

ASSOCIATE EDITORS—

Guenther Baumgart, William S. Connor, David B. Duncan,  
Walter Hoadley, Jr., J. E. Morton, Almarin Phillips, Harry  
V. Roberts.

DEPARTMENT EDITORS:

News and Notes

Dana Barbour

Questions and Answers

Ernest Rubin

International Statistical Activities

Joan Raup Rosenblatt

Correspondent for Federal Statistical Activities:

Virginia Venneman

OFFICERS OF THE ASSOCIATION

President: Rensis Likert

Past President: Walter E. Hoadley, Jr.

President-Elect: Morris H. Hansen

Vice-Presidents: Churchill Eisenhart, Howard L. Jones, Guy H. Orcutt

Directors: A. H. Bowker, Raymond T. Bowman, Ralph E. Burgess, H. O. Hartley, Oscar Kempthorne, Geoffrey H. Moore

Secretary: Donald C. Riley

Members of the Council: Charles M. Armstrong, Hugh H. Brown, Malcolm E. Catlin, Edwin L. Crow, Cuthbert Daniel, Herbert T. David, Paul M. Densen, David B. Duncan, W. T. Federer, Robert Ferber, A. L. Finkner, S. M. Free, Irwin Friend, Bernard G. Greenberg, Morris Hamburg, James W. Knowles, Arthur S. Littell, John T. Marshall, Philip J. McCarthy, John C. McKee, Paul Meier, Wesley D. Mitchell, Paul R. Rider, Philip J. Rulon, Jacques Saint Pierre, Henry Scheffe, Marvin A. Schneiderman, William H. Shaw, Walt R. Simmons, Albert T. Sommers, Frederick F. Stephan, W. Allen Wallis, Emmet H. Welch, Colin White, Martin B. Wilk, Albert W. Wortham.

The Editorial Committee welcomes the submission of manuscripts for possible publication. Two copies, double-spaced, should be sent to the Editor, Morris Hamburg, E-230 Dietrich Hall, University of Pennsylvania, Philadelphia 4.

News and notes should be sent to Dana Barbour, News Editor, American Statistical Association, 1757 K Street, N.W., Washington 6, D. C.

Second class postage paid at Washington, D. C. The American Statistician is published five times a year—February, April, June, October and December—by the American Statistical Association, Editorial Office: 1757 K St., N. W., Washington 6, D. C. Subscription rate: one dollar and fifty cents a year or thirty-five cents per copy.

Anyone wishing to change his mailing address should allow eight weeks notice. A copy of the address taken from an issue of the periodical should accompany the change-of-address request.

## The President's Column

Rensis Likert



### A PROGRESS REPORT

As the year comes to a close I would like to report the progress of two projects. They represent different aspects of the Association's expanding activities and the Association as a whole is concerned with what is being accomplished by these means. One of these projects is new in 1959, the other is continued from previous years with enlargements and improvements on past methods. I shall not go into the new Journal Index again; this was reported to you in detail in the October 1959 issue of THE AMERICAN STATISTICIAN, as well as in other communications. You have received the order form with which you may purchase copies.

The new activity for 1959 is TECHNOMETRICS which is co-sponsored by the American Society for Quality Control. As you know, members of both ASA and ASQC can subscribe to TECHNOMETRICS at the special membership rate of \$6.00 per year; non-members subscribe at \$8.00 per year. When the Management Committee of TECHNOMETRICS was first laying out the plans and projections for the new magazine, certain goals were quite naturally set down. One of these was to determine the number of subscribers needed in order to insure that, within a certain period, the publication would be financially self-supporting. While this goal of course, has not yet been reached, it is my pleasure to report that the number of subscribers for 1959 has considerably exceeded the preliminary expectations. At the end of this year there are approximately 2000 paid subscriptions on the mailing list. There are more member subscriptions than non-member subscribers at present, as is only to be expected. However, non-member subscriptions are being received in quantity indicating that libraries and companies are adding this new publication to their files in increasing numbers. The promotional work for obtaining new subscriptions includes plans for mailings to a number of societies in which the use of statistics in physical sciences, chemistry and engineering is of interest to their membership. The second year will perhaps be the crucial one for it will determine, by the number of renewal subscriptions received, whether the hopes with which TECHNOMETRICS was launched have been realized.

(Continued on back cover)

# NEWS ANNUAL MEETING NEWS — REPORT ON MEETING OF BOARD OF DIRECTORS — TRAVEL GRANT SOURCES — RESEARCH AWARDS AND TRAINING GRANTS — MEETINGS, COURSES, NEW PUBLICATIONS — JOB OPENINGS

## ASA Annual Meeting

Members planning to attend the 1959 Annual Meeting of the American Statistical Association to be held December 27-30 at the Shoreham Hotel in Washington, D. C. should remember to register in advance in order to avoid delay. Pre-registration forms have been sent to members which should be returned with the \$2 registration fee. One registration covers attendance at sessions of the other societies meeting in Washington at the same time, as well as the ASA sessions. Hotel reservations should also be made well in advance. A flat rate of \$8 for single rooms and \$12 for double rooms has been secured at the Shoreham.

A booklet containing abstracts of the papers to be presented at the sessions of the American Statistical Association, the Institute of Mathematical Statistics and the Biometric Society (ENAR) will be available at the registration desk for \$1.00. A varied and interesting program has been arranged by the Program Committee under the chairmanship of Charles D. Stewart. This was published in the October issue of THE AMERICAN STATISTICIAN, subject to possible last-minute changes. Printed copies of the joint program of all the societies meeting in Washington at the same time will be available at the registration desk. The Presidential Address and the informal party will occur on Tuesday evening, December 29.

The Shoreham Hotel, located on the edge of Washington's beautiful Rock Creek Park is an excellent place in which to hold a convention, both because of its location and because it has a number of large meeting rooms. A large attendance is expected.

The local arrangements committee for the 1959 Annual Meeting is as follows:

<i>Chairman</i>	ERNEST J. ENGQUIST, JR., Internal Revenue Service
<i>Vice Chairman in Charge of Operations</i>	REXFORD C. PARMELEE, Bureau of Mines
<i>Vice Chairman in Charge of Finance</i>	HOWARD L. STIER, National Canners Assn.
<i>Assistant Treasurer</i>	TYNAN SMITH, Board of Governors of the Federal Reserve System
<i>Executive Secretary</i>	LUTHER W. STRINGHAM, Department of Health, Education and Welfare
<i>Co-Chairman, Committee on the Printed Program</i>	EDWIN D. GOLDFIELD, Bureau of the Census
<i>Co-Chairman, Committee on the Printed Program</i>	MORRIS B. ULLMAN, Bureau of the Census
<i>Chairman, Meeting Rooms Committee</i>	LORMAN C. TRUEBLOOD, Board of Governors of the Federal Reserve System
<i>Chairman, Employment Register Committee</i>	FRANKLIN M. AARONSON, Office of Civil & Defense Mobilization
<i>Chairman, Publicity Committee</i>	CARL M. SKONBERG, Federal Trade Commission MICHAEL AMRINE

*Chairman, Tours Committee*

JOHN B. BODDIE, JR., Office of Business Economics

*Chairman, Registration Committee*

W. R. TILTON, International Business Machines Corp.

*Chairman, Information Committee*

WINSTON MCS. DAVIS, Chesapeake & Potomac Telephone Co.

*Chairman, Exhibit Committee*

ELBERT T. MACRUDER, Chesapeake and Potomac Telephone Co.

SAMUEL L. BROWN, Council of Economic Advisers

*Chairman, Fee Events Committee*

VITO NATRELLA, Securities and Exchange Commission

*Chairman, Social Committee*

CHESTER M. MCCALL, JR., Booz-Allen Applied Research, Inc.

## October Board Meeting

The Board of Directors of the American Statistical Association met on October 28 at the Cosmos Club in Washington, D. C. Those present included President Rensis Likert; Past President Walter E. Hoadley, Jr., President-Elect Morris H. Hansen, Vice-Presidents Churchill Eisenhart and Howard L. Jones; Directors Raymond T. Bowman, Ralph E. Burgess, H. O. Hartley and Geoffrey H. Moore; Secretary-Treasurer Donald C. Riley and several guests who had been invited to participate in the discussion of various items.

Mr. Riley reported on some of the 1959 activities of the Association. In terms of new members it appears that 1959 will be one of the best years to date. Financially, it is expected that the Association will end the year with a small surplus.

There was discussion of the invitation to ASA to become a member of the Federal Statistics Users' Conference. Dr. Ralph Watkins described the purposes of the organization, which is primarily concerned with the adequacy of the Federal statistics program. The question was raised as to whether, since the Conference is concerned only with one area of statistical activity, it would be appropriate for the Association to join. On the other hand it was argued that the ASA has a major interest in the quality of the Federal statistical program and has been active in this regard since the Association was founded in 1839. It was finally decided to refer the matter to the Council at its next meeting.

Dr. Raymond T. Bowman, Chairman of the Joint Local Arrangements Committee for all the societies meeting in Washington in December, reported briefly. Over \$3200 in advertising has been sold for the joint printed program which will make the project self-sustaining.

Dr. Ernest J. Enquist, Chairman of the ASA Local Arrangements Committee, and Mr. Charles D. Stewart, Chairman of the Program Committee also reported on plans for the December meeting. Mr. Michael Amrine, Public Relations Consultant, has been retained by the American Statistical Association and the Institute of Mathematical Statistics to assist in the general publicity for the meetings.



Dr. Frank Meissner, Crown Zellerbach Corporation and Golden Gate College, San Francisco, had suggested in a recent article, "Adventures in Statistics via Educational TV", that a special committee on audio-visual aids in statistics be appointed by the American Statistical Association to assemble available materials in the field of audio-visual aids, particularly educational TV; critically review experience, including foreign experience; and plan a program. After some discussion it was voted to establish a committee which would be responsible for listing and editing available materials and investigating possible sources of funds for supporting a program.

Dr. William H. Shaw, Chairman of the Business and Economic Statistics Section, reported on the results of a questionnaire which had been sent to members of that section to ascertain their interest in a possible refresher course in statistical techniques. He requested that the Board approve an experimental course over a two-year period beginning in the summer of 1960, provided that the Business and Economics Statistics Section gives its approval at its business meeting. The incoming Chairman of the Section would be authorized to negotiate for the course with one or more schools, with the understanding that the project would be self-supporting. The section would cooperate with the Training Section and the ASA National Office. A motion to this effect was voted.

Mr. Walt R. Simmons, Chairman of the Social Statistics Section, reported that the 1958 edition of the Social Statistics Section Proceedings was nearly sold out. He asked that the Section be authorized to publish the Proceedings again in 1959. The Board voted to recommend this to the Council.

Mr. Riley noted that the 1960 Annual Meeting, to be held at Stanford University August 23-26, will be joint with the Institute of Mathematical Statistics, the Western Economic Association, the Western Farm Economic Association, the Biometric Society ENAR, and probably also the Biometric Society WNAR. It was pointed out that the more frequent use of late summer or early fall as a meeting date would facilitate arranging joint meetings with societies which do not meet during the Christmas week.

### **Travel Grants for Attendance at ISI 1960 Meeting**

Additional sources are available for travel grants to attend the 32nd Session of the International Statistical Institute to be held in Tokyo from May 31-June 9, 1960. These are in addition to the American Statistical Association travel grants and those of the Social Science Research Council which were described in the October issue of THE AMERICAN STATISTICIAN.

The National Science Foundation is now in a position to make a limited number of grants. Applications for these grants must be filed before February 1, 1960. Application forms can be obtained from the National Science Foundation, Washington 25, D. C. Dr. Gertrude Cox, Head of the Statistics Research Division, Research Triangle also has some funds available. Interested persons should write

to her at the Research Triangle Institute, 505 W. Chapel Hill St., Durham, N. C.

### **NBS Postdoctoral Research Associateships**

Research associateships, supported by the National Bureau of Standards and awarded on recommendations of the National Academy of Sciences-National Research Council, are offered to provide young investigators of unusual ability and promise the opportunity for basic research in various branches of the physical and mathematical sciences. It is expected that approximately 20 awards may be made in a total of twenty-nine fields, of which the following are of particular interest to statisticians: Pure and Applied Mathematics, Applied Mathematical Statistics, Numerical Analysis. These research associateships are open only to citizens of the United States, and in the foregoing fields are tenable only at the National Bureau of Standards in Washington, D. C. Applicants must have received or completed the requirements for a Ph.D. or Sc.D. degree, or equivalent, in one of the fields listed above at the time of entering upon the research associateship.

The annual gross stipend will be \$7510 and will be subject to income tax. Travel and moving expenses of the Research Associate and his family from place of residence to Washington, D. C. will be paid by the National Bureau of Standards. Awards will be made about April 1, 1960. Unless otherwise arranged the tenure of a research associateship may begin after July 1, 1960 and continue for one year, with provision for a vacation period.

Requests for application forms or for additional information should be addressed to the Fellowship Office, National Academy of Sciences-National Research Council, 2101 Constitution Avenue, N.W., Washington 25, D. C. *Applications for the academic year 1960-1961 must be received in the Fellowship Office no later than February 1, 1960.*

### **Training Grants in Biological and Medical Research**

Stanford University is in its second year of a program for training Ph.D. students in Statistics who are interested in pursuing statistical careers in biological or medical research. The program is administered by the Statistics Department under a training grant from the United States Public Health Service and with the cooperation of the Medical School.

Eligibility requirements for acceptance in the program are the same as for admission to the Statistics Department and involve strong mathematical preparation and evidence of high scholarship. There are no special prerequisites in biological science. Some informal instruction in these areas is given during the training through seminars and consultation on problems.

Training stipends (ranging from \$2800 upward) are available and are ordinarily sufficient to meet tuition costs and to permit full time study without outside work.

Further inquiry can be addressed to Professor Lincoln E. Moses, Department of Statistics, Stanford University, Stanford, California.

## Annual Meeting of Federal Statistics Users' Conference

The Third Annual Meeting of the Federal Statistics Users' Conference was held at the Statler-Hilton Hotel in Washington on September 29-30. Attendance was larger than for either of the previous annual meetings: more than 100 nongovernmental users of Federal statistics and 60 guests from Federal statistics-producing agencies participated in the various sessions.

William F. Butler, Vice President, Chase Manhattan Bank, speaking at the September 29 luncheon session, paid tribute to the development of Federal statistics over the past 30 years but noted the need to reduce still further "the area of conjecture." He saw a need for better information on: (1) future government expenditures, (2) new orders for capital goods, (3) inventories, (4) consumer expenditures on durable goods, (5) construction and housing, and (6) corporate profits. He also spoke of the need for more regional data and more timely release of data bearing on net foreign investment.

Congressman Thomas B. Curtis, speaker at the September 30 luncheon session, urged the FSUC to make a critique of the statistical materials in each year's Economic Report, and to do more to bring the need for better statistical information to the attention of Congress. Declaring that "we have people in Congress who would help to get better statistics," Congressman Curtis pointed out that he, a member of the "economy bloc," worked for increases in the statistical budget because he believes that Congress needs more adequate statistics.

Six round table discussions dealt with: (1) Inter-industry Purchases and Sales: A Tool of Many Uses (Marvin Hoffenberg, CED chairman); (2) Statistical Reporting of Federal Government Procurement Activities: Is It Adequate? (Howard L. Stier, American Marketing Association, chairman); (3) Recent Revisions in Major Economic Indicators: GNP and FRB Industrial Production Index (John A. Baker, National Farmers' Union, chairman); (4) Distribution Statistics and Their Geographic Breakdown (Charles W. Smith, McKinsey & Company, Inc., chairman); (5) New Programs of Wage and Productivity Statistics: Uses and Problems (Charles Donahue, United Association of Plumbers and Pipefitters, chairman); and (6) Statistics of Income: Recent Advances and Future Prospects (Gerhard Colm, National Planning Association, chairman).

New trustees were chosen at the meeting to represent business, farm, labor and nonprofit organizations: from the business group—Richard M. Allerton, National Association of Broadcasters; A. Arthur Charous, Sears, Roebuck & Company, and Gordon Hughes, Scott Paper Company (reelected); from the farm group—John A. Baker, National Farmers' Union (reelected); from the labor group—Peter Henle, AFL-CIO (reelected), Ben B. Seligman, Retail Clerks International Association, and Lazare Teper, International Ladies Garment Workers Union (reelected); and from the nonprofit organizations—William B. Dale, Stanford Research Institute, and Thomas C. Fichandler, Twentieth Century Fund. Officers

elected by the new board are: Peter Henle, chairman; and R. J. Eggert, John A. Baker and Howard L. Stier, vice chairmen.

"A Long-Term Program for the Improvement of Federal Construction Statistics" was submitted by the Conference on October 16 to the Director of the Bureau of the Budget. The report results from a survey of user needs for better construction statistics made by the Conference during the past year. Over 200 users participated in preparation of the report, which is a comprehensive yet economical program for the long-term improvement of Federal construction statistics.

## Statistics Center at Rutgers University

Rutgers University has established a Statistics Center which will be the State University's central unit for research and teaching in the field of statistics. It will continue to offer at Rutgers the Masters' Degree program and in addition will have responsibility for a program of study leading to the Ph.D. in Applied and Mathematical Statistics.

The Center, which is under the administration of Dr. Marion A. Johnson, dean of the Graduate School, will be directed by Dr. Ellis R. Ott, who has previously served as professor of Mathematics and Chairman of the Mathematics Department of University College, as well as Chairman of the Rutgers program in Applied and Mathematical Statistics. Director of Research at the Center will be Dr. Martin B. Wilk. The staff will also include Dr. Roger S. Pinkham, Dr. Mason E. Wescott and Harold F. Dodge.

The Statistics Center will be responsible for programs of research in statistical theory and methodology and in ways of promoting the more effective use of statistics in science, industry, education and other areas. It will also make available, both within and without the University, consultative services with respect to the use of statistics and statistical techniques in research or other experiments and surveys, and with respect to the analysis and presentation of data.

Since 1952, Rutgers has had course work leading to a Master's degree in the field of Applied and Mathematical Statistics. Through June, 1959, a total of 85 Master's degrees in applied and mathematical statistics had been awarded, mostly to full-time employees in nearby industries. The present development constitutes a major extension of the Rutgers Statistics Program plus an administrative reorganization.

## Summer Offerings in Statistics at Iowa State University

The Department of Statistics at Iowa State University will offer six applied courses in statistical theory and methods in its two 1960 summer sessions. These courses are planned primarily for graduate students or research workers with limited mathematical backgrounds who wish to use statistical techniques intelligently for application to other fields. In addition, courses in special topics in theoretical or applied statistics may be studied at the graduate level. Senior staff members will be avail-

able during most of the summer for consultations on research or special problems.

Students may register for either or both of the six-week summer sessions: June 6-July 13 and July 13-August 19. The complete list of statistics offerings for the first session is as follows: Stat. 401, "Statistical Methods for Research Workers" (at the level of Snedecor's *Statistical Methods*); Stat. 447, "Statistical Theory for Research Workers" (mainly theory of experimental statistics at the level of Anderson and Bancroft's *Statistical Theory in Research*); Stat. 599, "Special Topics;" and Stat. 699, "Research." In the second session will be offered Stat. 402, a continuation of 401, Stat. 448, a continuation of 447; two courses in applied methods which are more specialized—Stat. 411, "Experimental Designs for Research Workers," and Stat. 421, "Survey Designs for Research Workers;" and finally Stat. 599 and 699. Additional information may be obtained from T. A. Bancroft, Department Head and Director, Statistical Laboratory, Iowa State University.

### 1959 Pennsylvania Statistical Abstract

The Bureau of Statistics in the Pennsylvania Department of Internal Affairs has completed the 1959 *Pennsylvania Statistical Abstract*. This publication, the second annual edition, has been considerably expanded in comparison with the 1958 Abstract. Four new sections have been added. They are Parks and Recreation; Hospitals and Hospitalization; Municipal, Housing and Redevelopment Authorities; and Military and Veterans Affairs. Other sections include Population, Income, and Religion; Education; Area, Geography, and Climate; Vital Statistics; Accidents; Social Insurance and Welfare Services; Law Enforcement, Courts, and Prisons; The Legislature, Elections, and Registration; State Government; Local Government; Prices; Labor Force, Employment, and Earnings; Agriculture; Mineral Production; Construction; Manufacturing; Transportation; Communications and Public Utilities; Distribution and Services; and Banking and Finance.

Ninety-five of the 174 tables in the Abstract are completely new; 40 of these tables present statistics never before published. Statistics on church membership, libraries, cultural institutions, characteristics of the unemployed, characteristics of the state legislators, expenditures and budget proposals for state agencies, elected local government officials, local option, membership in trade unions, alleged discriminatory acts, industrial development, world trade, newspaper circulation, and veterans benefits have all been added to the Abstract. The 168-page booklet also includes 28 graphs and map diagrams, and a subject index.

The purposes of the Pennsylvania Abstract are to present a comprehensive and integrated collection of up-to-date statistics for Pennsylvania together with explanatory notes and source information. The explanatory notes describe the methods of collection and compilation of the statistics in each section and present definitions of concepts used. Reference notes for each source of

statistics in the Abstract are included, as well as references to other sources of statistics on Pennsylvania.

Copies of the 1959 *Pennsylvania Statistical Abstract* may be purchased from the Division of Documents, 10th and Market Streets, Harrisburg, Pennsylvania for \$1.50. Checks or money orders should be made payable to the Commonwealth of Pennsylvania.

### AAAS Sessions

The American Association for the Advancement of Science is holding its annual meeting in Chicago, December 26 to 31, 1959. The American Statistical Association and Section K of the AAAS (Social and Economic Sciences) are co-sponsoring two sessions.

The first of these, "Descriptive Statistics", will be held at 2:00 p.m. December 29 in the Chicago Room of the LaSalle Hotel. The speakers and their subjects are: Irene B. Taeuber, Princeton University, "China's Population Statistics: the Ch'ing Dynasty"; Karen G. Hillman, Northwestern University, "Marital Instability and its Relation to Education, Income and Occupation: an Analysis Based on Census Data"; Duncan MacRae, Jr., University of Chicago, and James A. Meldrum, Northern Illinois University, "Seventy Years of Illinois Voting: 1888-1958"; and Earl A. Heady, Iowa State University, "Estimation and Use of Production Functions in Agriculture."

The second session is devoted to "Statistical Techniques", and will be held at 9:00 a.m. December 30 in the Chicago Room of the LaSalle Hotel. R. Darrell Bock, University of North Carolina, will speak on "Beyond Factor Analysis"; John W. Cotton, Northwestern University, will deal with "A Re-examination of the Repeated Measurements Problem"; Robert McGinnis, University of Wisconsin, will discuss "The Use of Forced Choice Questions and the Power Function"; and Lee J. Cronbach, Nageswari Rajaratnam, and Goldine C. Glaser, University of Illinois, will speak on "A Comprehensive Model for Reliability Theory."

Other sessions which may be of interest to statisticians are one the morning of December 28 on "Trends in the Application of Mathematics" co-sponsored by Section A of the AAAS (Mathematics) and the Society for Industrial and Applied Mathematics, and one the afternoon of December 29 entitled "Today and Tomorrow in the World of Computers", sponsored by the Association for Computing Machinery.

### Quality Control Documents Available

Two documents published by the Office of the Assistant Secretary of Defense (Supply and Logistics) have been made available recently to quality control personnel in Government and industry.

One of these is Inspection and Quality Control Handbook (Interim) H 107 "Single-Level Continuous Sampling Procedures and Tables for Inspection by Attributes". This Handbook provides information on the basic principles of single-level continuous sampling inspection by attributes, and includes instructions for the selection



and administration of the sampling inspection procedures. It is a companion document to the Department of Defense Handbook H 106 on multi-level continuous sampling plans which was published last year. It may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at the price of 55 cents a copy.

The second document is revision B to Military Standard 105, "Sampling Procedures and Tables for Inspection by Attributes." The wording of this Standard has been revised to permit Department of Defense suppliers to perform the sampling inspection procedures per MIL-STD-105 required by many specifications and other contractual documents prior to submission of their supplies to the Government for verification inspection and acceptance. This publication is also available for purchase from the Superintendent of Documents at the price of 40 cents a copy.

### **New Officers of Psychometric Society**

The officers of the Psychometric Society for the year beginning October 1, 1959, are:

President: Lloyd G. Humphreys, Department of Psychology, University of Illinois.

Secretary: Philip H. DuBois, Department of Psychology, Washington University, St. Louis.

Treasurer: William B. Schrader, Educational Testing Service, Princeton, N. J.

Membership in the Psychometric Society is open not only to psychologists but also to workers in related areas. Chairman of the Membership Committee is William B. Michael, 3518 University Ave., Los Angeles, 7, California.

The next annual meeting will be held in Chicago September 5 to 7, 1960, in connection with the annual meeting of the American Psychological Association.

### **Change in "Mathematical Tables and Other Aids to Computation"**

In January, 1960, the title of *Mathematical Tables and Other Aids to Computation*—published quarterly by the National Academy of Sciences-National Research Council since 1943—will be changed to *Mathematics of Computation*. The new name reflects the broadened scope of the journal, which has expanded to meet the need in this country for a publication devoted to numerical analysis and computation. Subscribers to *Mathematics of Computation* will find future issues of the journal to be a continuation of *Mathematical Tables and Other Aids to Computation*, with similar style, format and character of contents, but with increased emphasis on modern advances in the theory and application of computational methods.

Subscriptions will remain at \$8.00 per year and should be sent to:

The Printing and Publishing Office  
The National Academy of Sciences  
2101 Constitution Avenue  
Washington 25, D. C.

### **Changes in Michigan Survey of Consumer Finances**

The University of Michigan Survey Research Center will conduct the 1960 Survey of Consumer Finances with the support of a \$300,000 grant from the Ford Foundation. Based on personal interviews with a representative sample of more than 3,000 spending units, the Survey is a basic source of information on the financial status of consumers, their demographic composition, and their economic attitudes.

Conducted annually since 1946, the Survey previously was supported entirely by the Federal Reserve Board. Next year's Survey will be supported in part by private business. In 1960, the collaboration between the Board and the Center will be directed primarily toward developing better data in the field of individuals' financial assets and attitudes toward these holdings.

The Ford Foundation grant will extend over a five-year period. One part of the grant will make Survey of Consumer Finances data more readily available to the academic world and more useful for tests of economic theory. The Center, a division of the Institute for Social Research, will conduct a series of summer workshops for teachers and researchers and will prepare data from its annual surveys for consumer research at other universities.

Another portion of the Ford Foundation grant will provide for transition from governmental to private support of the Survey of Consumer Finances. Some of the nation's best known business firms and industrial associations already have agreed to share a portion of the Survey's costs. Others are welcome to participate, according to Prof. George Katona, director of the Center's economic behavior program. Sponsors will receive detailed reports showing changes in and relationships between consumers' financial position, their major purchases, demographic factors, and economic attitudes. The traditional release of preliminary data from the Survey to the press in March will be continued.

In addition to the Survey of Consumer Finances, which is conducted during January and February, the Center also makes periodic surveys of consumer attitudes and intentions to buy. These have been supported privately in the past and will continue on the same basis. The Center also will conduct a special study of low-income families next spring.

### **Job Openings**

There is an urgent need for mathematicians and mathematical statisticians in the Office of The Quartermaster General, Washington 25, D.C. Starting salaries range from \$6,285 to \$10,130. An interest in scientific or data-processing applications of electronic computers is important, but actual computer experience is not essential. Some proficiency in either numerical analysis or statistical data handling is desired. Persons wishing to be considered should communicate with Civilian Personnel Division, Office of The Quartermaster General, Washington 25, D.C.



# International STATISTICAL ACTIVITIES

## VISITING SCHOLARS

A list appears below of visiting scholars whose work is in probability and statistics or in related fields. A supplementary list will appear in the February 1960 issue of *THE AMERICAN STATISTICIAN*. Information concerning present or future visitors to the U. S. or Canada will be welcome.

### EL SALVADOR

In May 1959 the General Bureau of Statistics and Censuses (DGECC) introduced a semiannual publication entitled *Comercio Exterior*, which contains data on international trade. The first issue covered the period from January to June 1958, and included also index number series for foreign trade with corresponding graphs. The methodology employed in the preparation of the index numbers was described in the introduction.

—Inter American Statistical Institute

### GERMANY, WEST

The 30th annual meeting of the **German Statistical Society** was held from September 30 to October 2, 1959, in Darmstadt, in conjunction with the sessions of the Association of Statisticians of German Cities (September 28-30, 1959).

A session on "Use of machines and automation in statistics" was arranged by **Dr. G. Furst** (Wiesbaden). The first speaker was **Dr. K. Szameitat** (Wiesbaden) who discussed "Possibilities and Limitations of Automation in Statistics". Eight additional papers treated aspects of the history, methods, and current operational problems of statistical data-processing, and the expected advantages of automation. Speakers included **Dr. K. Zuse** (Bad Hersfeld), **Dr. J. Götz** (Saarbrücken), **Dir. E. C. Chandon** (Düsseldorf), **Dr. H. W. Schäfer** (Munich), **Dipl.-Econ. R. Giehl** (Munich), **Prof. S. Koller** (Wiesbaden), **Dipl.-Math. H. J. Zindler** (Wiesbaden), and **Prof. A. Walther** (Darmstadt).

At a joint meeting of the Committee on Application of Statistical Methods in Industry and the Committee on New Statistical Methods, papers were presented on "Statistics in the Scientific Study of Labor" (**Dr. A. Adam**, Vienna), "On Technical-Statistical Experience in a Steelworks" (**Dr. R. K. Bauer**, Krefeld), and "Modern Methods in Banking Statistics" (**Dr. I. Esenwein-Rothe**, Wilhelmshaven). A joint meeting was held by Subcommittee I on Market Research and Market Analysis with the Working Group on Regional Statistics.

—**Dr. O. Boustedt**, Secretary  
German Statistical Society

## VISITING SCHOLARS IN THE UNITED STATES AND CANADA

Name	Home Country	Host Institution	Period of Visit
BERGSTROM, H.	Sweden	Catholic University	Sep. 1960-July 1961
BHATTACHARYYA, B. B.	India	North Carolina State College	Oct. 1959-indefinite
CHAKRAVARTI, I. M.	India	University of North Carolina	Sep. 1959-Aug. 1960
COX, Philip	United Kingdom	Iowa State University	1959-1960
DUGUE, Daniel	France	Catholic University	Mar. 1960-June 1960
DURBIN, J.	United Kingdom	University of North Carolina	July 1959-June 1960
GANI, J.	Australia	Columbia University	1959-1960
HANNAN, E. J.	Australia	University of North Carolina	Oct. 1959-May 1960
HEALY, M. J. R.	England	Bell Telephone Laboratories	Oct. 1959-indefinite
JAMES, A. T.	Australia	Yale University	1959-1960
JENKINS, Gwilym M.	United Kingdom	Stanford University	Sep. 1959-Sep. 1960
KAMPE DE FERIET, Joseph	France	David Taylor Model Basin and Harvard University	Mar. 1960-April 1960
LAHA, Radha G.	India	Catholic University	Sep. 1957-Sep. 1960
ROY, Jogabrata	India	University of North Carolina	Oct. 1959-Sep. 1961
SUKHATME, B. V.	India	Michigan State University	1959-1960
URBANIK, Kazimierz	Poland	Tulane University	Fall semester 1959-1960
WATSON, G. S.	Australia	University of Toronto	1959-1960

## JAPAN

A report on **Quality Control in Japan**, prepared by a Quality Control Specialists Study Team, has been made available in a special issue of volume 6 (1959) of *Reports of Statistical Application Research*, published by the Union of Japanese Scientists and Engineers.

This report includes sections on education and training, on the current status of quality control practice (including a summary of statistical techniques), and surveys of quality control activities of many major industry groups.

—Rep. Stat. Appl. Res., JUSE  
Tokyo

## UNITED KINGDOM

The General Applications Section of the Royal Statistical Society held a **Conference on Statistical Methods in Social Investigations**, at Queens' College, Cambridge, September 25-27, 1959. Copies of the program may be obtained from the Society. Sets of the papers presented may be obtained for twelve shillings or two dollars, including cost of postage, from: The Secretary, Royal Statistical Society, 21 Bentinck Street, London, W. 1, England.

—J. A. Bound  
Quaker Oats Ltd.  
Southall, Middlesex

Among the 179 persons registered at the Conference on Statistical Methods in Social Investigations were at least three from the U. S. Ten papers were presented, in two parallel sessions. About half of the papers dealt with general questions of methodology, while the remainder presented the results and techniques of particular investigations. A paper on "Recent developments in distribution free methods" (A. Stuart, London School of Economics) evoked a lively discussion about the purposes of statistical analysis and the relative places for estimation and for testing hypotheses.

The Conference closed with a Symposium on the Use of Electronic Data-processing Equipment in Analyzing Large Scale Investigations. To illustrate the possibili-

## RELIABILITY ENGINEERS

Convair-Astronautics has several professional openings for experienced engineers with applied higher mathematics education, preferably in statistics. A B.S. degree is required, a higher degree preferred. Circuit analysis with transistor and diode experience is also desirable. These positions are in San Diego, California.

If you qualify, write in confidence to:

**Mr. T. W. Wills,**  
Engineering Personnel Administrator  
Convair-Astronautics, Dept. 130-90  
5635 Kearny Villa Road  
San Diego, California

ties for machine applications, R. Thorby (General Register Office) described an interesting programming technique for computer production of a table of marital status by sex and age, based on a numerically derived coding of categories by the computer. W. Gregory (Gallup Poll) emphasized the writing ability of computers, and the resulting freedom from repeated proof-reading of tabulations.

—Marvin A. Schneiderman  
(U. S. National Cancer Institute)  
London School of Hygiene and  
Tropical Medicine

## RESEARCH ANALYST II

**Salary: \$5,328-\$7,128 per year**

Requires 2 years research analyses experience and graduation from college with a major in social science including course work in research and statistics. For application and further information write to: State Department of Civil Service, 825 Mililani Street, Honolulu, Hawaii.

## UNESCO

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is making preparations to hold a **seminar on educational statistics**, in Brazil in 1960. The seminar will be chiefly concerned with (1) methods of compiling, analyzing and publishing educational statistics in Latin American countries; (2) the application of international recommendations on the standardization of educational statistics; (3) the use of educational statistics in the preparation of national plans for educational, social and economic development; and (4) the training of educational specialists in Latin American countries.

—Inter American Statistical Institute

## FEDERAL STATISTICAL ACTIVITIES

### BLS Price Index Revision Project

The Bureau of Labor Statistics has begun a 5-year project of revising its consumer price indexes and related statistics. Funds for the first year of this program were included as a separate item in the 1960 budget. The project will give primary emphasis to the preparation of a revised Consumer Price Index (CPI), which BLS expects to publish in January 1964. For this purpose up-to-date information will be obtained on consumer expenditures by means of a comprehensive survey of cities throughout the country, and this information will also be used to revise other BLS statistical data, such as the city worker family budget.

At the request of the Bureau of the Budget, the National Bureau of Economic Research has agreed to "undertake a review of the Federal Government's statistical programs dealing with prices and price index numbers and make recommendations concerning improvements and additions which may be needed for more effective analysis." This review will include in its scope the BLS Consumer Price Index and the price collections related to it which are useful for other purposes. In addition BLS plans to bring together a professional group to review its plans for the consumer expenditure survey, which is not specifically included in the NBER review. Within the U.S. Government the Office of Statistical Standards, Bureau of the Budget, will also review the project and will obtain the professional advice of interested Federal agencies.

#### *Dwelling-unit and consumer expenditure surveys*

Before the revision project can begin it will be necessary for the BLS to determine definitely the cities for which the revised CPI is to be computed. Although this determination is not yet final, it is expected that the number of cities will not be more than 70 for the expenditure surveys about 50 for price data collection. These numbers compare with 97 cities for which expenditure data were collected in the 1950 revision, and 46 cities for which price data are collected currently to produce the CPI for the United States.

The first basic phase of the revision project will be a survey of dwelling units in each of the expenditure-survey cities. One half of the cities will be surveyed in the autumn of 1960 and the remaining half in the autumn of 1962. The dwelling-unit surveys serve two major purposes: they provide in each city a typical sample of dwelling units which is used in the consumer expenditure survey for that city and they provide up-to-date samples of dwelling units for the BLS survey of rents which is part of its pricing program.

The second phase of the project will be the consumer expenditure survey itself. In this phase also the sample will be split. Those cities for which dwelling-unit surveys are made late in 1960 will be surveyed for consumer expenditures in January to March 1961. The remaining cities will be surveyed in January to March 1962. BLS is planning to make each sample independent and repre-

sentative, and the two groups of cities will be formed with this objective in mind. Very large cities will be split, and one half will be allocated to each sample. The BLS is planning a pilot survey of consumer expenditures in a "lead city" (Cincinnati) in early 1960.

#### *Revision of weights for consumer price indexes*

As the first step in the computation of revised weights the survey schedules for families of wage earners and clerical workers will be separated from the other survey schedules for each city and their expenditures will be analyzed. In the 1950 revision the families selected in this manner were those which consisted of at least two persons living in towns or cities of 2500 or more population, whose heads of family were wage earners or salaried clerical workers and whose family income (including the income of all earners in the family) did not exceed \$10,000. The income cut-off of \$10,000, used in 1950, was primarily a technical device intended as a check on the correctness of the occupational classifications reported in the expenditure-survey interviews. This criterion may be modified in the current revision. In terms of coverage of the population, however, the BLS is not considering a change in the concept of the CPI, and the index, according to present plans, will continue to relate to families of wage earners and clerical workers in urbanized areas.

The derivation of weights for the city CPI will not be a straight computation from the expenditures of the index-type families as shown in the city surveys. It is expected that the adjustments to the reported expenditures in the current revision project will be similar to those made in the 1950 revision.

#### *Revision of price collection and related procedures*

The Bureau of Labor Statistics is now engaged in drawing up plans for the re-examination and revision of its pricing procedures. This study will include the re-examination and possible modification of the criteria for selecting items to be priced, and a re-study of the relationships between prices of different commodities. The latter are of extreme importance since they form the basis for imputing the price movements of a priced commodity to others for which actual prices are not collected. The revised price data will, of course, be used in CPI, and for the direct publication of price averages.

In the collection of data on rental costs, a subsidiary use is made of the comprehensive dwelling-unit survey described above. In survey cities for which average rents are to be collected, a sample of "rental" dwelling units is selected from the comprehensive list of dwelling units. This "rent sample" will serve as the basis for the BLS continuing program of estimating monthly changes in average rents.

#### *Supplemental products of the revision project*

Since the expenditure surveys in the 70 cities will furnish a cross section of the entire urban population (including single consumers and others not covered by the CPI),



data on average expenditures for the urban population and various categories can be obtained. As these surveys represent the chief source of comprehensive data on urban expenditures in the United States, the data will be in demand particularly for general economic and market analysis. Plans have not been completed, but budget provision has been made for tabulations of this type and the BLS plans to publish the data in detail.

Revisions of the city-worker family budget and the elderly couple budget involve much analytical work and the utilization of many other sources. Nevertheless, the expenditure surveys will furnish the basic materials for the analysis of these budgets and their probable revision. These revisions, although it is not possible to indicate their dates of completion, form a definite part of the revision project.

The surveys will also furnish basic data for numerous studies by the BLS and other agencies on comparisons of expenditure patterns between different localities and other topics.

#### *Chronology of the revision program*

Present plans call for the following chronology of the various phases of the revision project:

*Fiscal year 1960*—Devoted primarily to planning, with a pilot survey of consumer expenditures in one "lead city"—Cincinnati. Under a special authorization of funds, expenditure surveys and price work in Alaska will be coordinated with the price revision project.

*Fiscal year 1961*—Dwelling-unit surveys and surveys of consumer expenditures in approximately half of the survey cities, with certain large cities covered in both 1961 and 1962 in order to permit each sample to be a representative cross section of urban United States.

*Fiscal year 1962*—Dwelling-unit surveys and surveys of consumer expenditures in the remaining half of the survey cities.

*Fiscal year 1963*—Computation of weights and trial indexes.

*Fiscal year 1964*—Publication of the revised CPI planned for January 1964, and dual publication of indexes on both the old and the revised bases for January through June 1964.

—Thomas F. Mosimann, Office of Statistical Standards, Bureau of the Budget

### **New List of Standard Metropolitan Statistical Areas**

A document on "Standard Metropolitan Statistical Areas" has been published by the Bureau of the Budget, presenting the revised list of definitions for 192 metropolitan areas and two Standard Consolidated Areas. In an introductory statement the pamphlet describes the purposes to be served by delineation of the areas and sets forth the criteria by which they are defined.

Standard definitions were first issued in 1949 to make it possible for all Federal statistical agencies to use the same boundaries in publishing statistical data on metropolitan areas. Definitions in terms of counties (in New England of towns) are established by the Bureau of the

Budget with the advice of the Federal Committee on Standard Metropolitan Statistical Areas, representing the major Federal statistical agencies. The areas are delineated on the basis of specific and objective criteria of a quantitative nature. Revised criteria were adopted by the committee in March 1958.

All area definitions have been reviewed in terms of the revised criteria. When compared with the October 1950 list, the new list of 192 includes 20 new and 40 amended area definitions. Of the 20 new areas, population growth as indicated by special censuses accounted for 9; the amended central city criterion providing for twin city eligibility accounted for 4; annexations for 2; and splitting of previously defined areas 5. Of those subdivided into two or more areas, the Chicago area and New York-Northeastern New Jersey area are probably the most significant, with the Chicago area being split into two areas and the New York-Northeastern New Jersey area divided into four areas. To meet the need for more inclusive metropolitan area statistics for these areas, the new designation of Standard Consolidated Areas has been added.

The new list of 192 Standard Metropolitan Statistical Areas will be used in tabulating data from the 1958 Censuses of Business, Manufactures and Mineral Industries and the 1960 Censuses of Population and Housing. It will also be used in presenting current employment and payroll data, in labor market and housing market analysis, and for various other statistical and analytical purposes.

Copies of "Standard Metropolitan Statistical Areas" (12 pages, 15 cents) may be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

—Peyton Stapp, Assistant Chief, Office of Statistical Standards, Bureau of the Budget

### **Census—FRB Surveys of Business Financing Experience**

The Bureau of the Census, cooperating with the Board of Governors of the Federal Reserve System, conducted several pretest surveys during November and December 1958 to determine the most effective ways of obtaining information on the financial structure and the financial practices and problems of corporate manufacturing and unincorporated trade firms. As a result of this experience, a full-scale survey of manufacturing corporations was designed and questionnaires were mailed to selected respondents August 31, 1959.

The corporate manufacturing survey sample consists of a systematic selection of firms with equal probability of selection within each of twelve classes. The twelve classes are defined to include three size classes—small, medium, and large—within each of four broad industry divisions—heavy durable, heavy nondurable, light durable, and light nondurable. The three size classes have been defined separately for each of the four broad industry divisions, which results in a size classification for each firm which is relative to the order of magnitude in that firm's industry division. Approximately 3,600 sample firms were selected from fiscal year 1958 Internal



Revenue Service records with the cooperation and assistance of IRS and the Federal Trade Commission. The size of sample is designed to yield a standard error of 2.5 percentage points for the maximum variance case of 50 per cent within each of the twelve classes.

The corporate manufacturing questionnaire calls for a beginning and ending balance sheet and a profit and loss statement covering the firm's 1958 fiscal year. In addition, the questionnaire is designed to obtain information on each firm's financing experience and problems during the twelve-month period. The pretest experience suggests that a response rate of approximately 90 per cent can be expected, with follow-up procedures which include the use of certified mail, telephone calls, and limited personal visits to nonrespondents. Data from the corporate manufacturing survey are expected to be available early in 1960 and subsequently will be published as a section of Part III of a Federal Reserve study of small business financing.

A second pretest of a survey designed to obtain similar information from unincorporated retail firms was conducted during May and June, 1959. The purpose of the series of pretests in the unincorporated business area is to gain insight into the magnitude of the response problems and to experiment with possible solutions to these problems. The pretest experience has thus far indicated that data on the financial experience and problems of these firms can be readily obtained for recent periods. Data on income and expense, formal accounting valuations of asset and liability items, and information on the non-business financial position of sole proprietors present progressively more difficult problems. The pretest data are now being evaluated.

—Daniel H. Brill, Chief,  
Capital Markets Section,  
Division of Research and Statistics,  
Board of Governors of the Federal Reserve System

### Among Recent Publications

*Business Statistics, 1959 Edition*, issued by the Office of Business Economics, Department of Commerce. Biennial statistical supplement to the monthly *Survey of Current Business*. This supplement provides descriptions of all statistical series appearing regularly in the 40-page statistical section of the *Survey*, carries these series back to 1929 on a monthly or quarterly average basis, and provides separate monthly or quarterly figures for the period 1955 through 1958. Available at \$2.25 a copy (360 pages) from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. or through the field offices of the Department of Commerce.

*Nonfarm Housing Starts, 1889-1958*, issued by the Bureau of Labor Statistics, Department of Labor. Final report of the work done by B.L.S. in the development of the nonfarm housing starts series. Describes the development of the series through time periods which mark significant changes in estimating procedures. Contains detailed tabulations that show the number of new permanent nonfarm dwelling units started, the type of struc-

ture (one-family and multi-family), and the location, ownership (public or private), and construction cost of new housing. Available at 30 cents a copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

*Preliminary Retail Trade Report for the State of \_\_\_\_\_*, issued by the Bureau of the Census. Series of preliminary reports from the 1958 Census of Business for each of the 50 states, the District of Columbia, Guam and Virgin Islands. Each report shows 1958 data on establishments, sales, payroll, and personnel (1) for major kind-of-business groups and for 18 more detailed kinds of business in the state; (2) for all retail trades combined for each county and each municipality with a population of 2,500 or more; and (3) for major retail kind-of-business groups in each standard metropolitan statistical area in the state. Comparative 1954 data are presented on a less detailed basis.

Comparable series of preliminary reports are being issued for wholesale trades and for the service trades. The former series is scheduled for issuance from November 1959 through January 1960; the latter series is scheduled to be completed by the end of December.

Available at 15 cents for each state report, \$6.00 for the complete set, from the Bureau of the Census, Washington 25, D. C., or from the field offices of the Department of Commerce.

*Health Statistics from the U.S. National Health Survey*, issued by the Public Health Service, Department of Health, Education and Welfare. Additional report in Series B (Results from the Household Interviewing)—B-11, "Limitation of Activity and Mobility Due to Chronic Conditions, United States, July 1957-June 1958". Provides data on persons with activity or mobility limitations, shown by family income, major activity, sex and age, and by urban-rural residence. Available at 30 cents per copy from the Superintendent of Documents, Government Printing Office, Washington 25, D. C.

*Chronic Labor Surplus Areas—Experience and Outlook*, issued by the Bureau of Employment Security, Department of Labor. Reviews some of the underlying factors responsible for the development of persistent unemployment problems in the chronic surplus areas, and examines the labor market experience of these areas during the recent recession and recovery periods. Also reviews the employment and unemployment outlook for all major areas of substantial labor surplus. Limited supply available without charge from Bureau of Employment Security, Department of Labor, Washington 25, D. C.

### "Project Talent"

The Office of Education has contracted with the University of Pittsburgh for a long-range study entitled "The Identification, Development, and Utilization of Human Talents," known also as "Project Talent." The project is being undertaken under the Cooperative Research Pro-

gram, established under Public Law 531, 83rd Congress, which authorizes the Commissioner of Education to enter into contracts with universities and colleges and State education agencies for the conduct of research, surveys and demonstrations in the field of education. Financial support for the project has also been received from the National Institute of Mental Health, the National Science Foundation, and the Office of Naval Research. John C. Flanagan, Professor of Psychology of the University of Pittsburgh, is principal investigator for the study, and the study director is John T. Dailey.

The central focus of Project Talent is to investigate how various factors (such as psychological and environmental characteristics, educational and guidance experiences) affect subsequent plans, choices and achievement. More specifically, the project has four major objectives: (1) to obtain a national inventory of the human resources of our high-school age youth; (2) to investigate the factors involved in the choices, plans and decisions made by high school students, especially with respect to college activities and vocational careers; (3) to evaluate the effects of various educational conditions and experiences on the subsequent careers of high school students; and (4) to determine the predictive value of various patterns of psychological test scores and related descriptive information with respect to college and occupational activities and achievements. An incidental result of the study will be a considerable addition to our knowledge about the American high school and its educational and guidance programs.

A series of 32 tests and 6 questionnaires, now being developed to measure individual traits and environmental factors affecting the development of the individual, have already been pretested in preliminary form. It is hoped to use these materials in a two-day testing session in March 1960, collecting information on aptitudes, achievement, personality, and interests, as well as biographical data from half a million high school students in grades 9-12 in a sample of 1,400 schools. The 1,400 schools will constitute an approximately 5-percent, scientifically designed, stratified sample of the nation's 30,000 secondary schools, both public and private, of all types of administrative organization. Problems involved in the selection of bases for stratification are now being investigated.

Plans for the project call for a follow-up of all students included in the initial data collection about one year after their graduation from high school, and follow-ups of at least a sample of students after 5, 10, and 20 years. Again a variety of instruments would be used to measure the current behavior, performance, achievement and status of the individual with respect to a number of important features of his life, such as choice of occupation, occupational success, career plans, marriage, mobility, personal aspirations and satisfactions, perception of himself, social adjustment, participation in community life, etc. These inquiries should provide the raw data for many studies of the effects of school and educational experience on later performance, achievement and expe-

rience, particularly vocational, for individuals of a given pattern of talent.

An important adjunct to Project Talent is the study of boys and girls of high-school age (exact age not yet determined) who are not enrolled in a high school program. Under a separate Cooperative Research contract, the University of Pittsburgh will administer the "Talent" battery of tests and questionnaires to a sample of these youths who are school drop-outs or are in special ungraded schools, homebound, or institutionalized, or who may have already graduated from high school. The sample will be integrated with the sampling plan for Project Talent.

Four expert advisory panels have been appointed to insure maximum use of available technical knowledge and experience. The general chairman of the advisory groups is John H. Fischer, formerly Superintendent of Schools in Baltimore and newly appointed as Dean of Teachers College, Columbia University. The specific functions of the four panels are:

Testing Problems Panel (Chairman, Robert L. Thorndike, Head of the Department of Psychological Foundations and Services, Teachers College, Columbia University)—To assist in the selection of specific tests and measurement devices.

Manpower and Sociology Panel (Chairman, Samuel A. Stouffer, Director, Laboratory of Social Relations, Harvard University)—To assist with problems of sample size and design and in defining manpower and socio-economic problems as a basis for establishing the type and form of data to be collected about the students' backgrounds and educational and subsequent experiences.

Guidance and Counseling Panel (Chairman, Edward Landy, Director, Division of Counseling Services, Newton Public Schools)—To assist with the development of specific plans for investigating factors related to choice of an occupation or profession and the development of motivational patterns.

Educational Research Panel (Chairman, Robert J. Keller, Director, University High School, University of Minnesota)—To assist in the definition of problems relating to secondary school and college curricula, methods of instruction, specific educational objectives, and characteristics of instructional staff.

—Wells Harrington, Chief,  
Research Advisory Service, Office of Education,  
Department of Health, Education, and Welfare

#### **Erratum. *Psychological Tests and Personnel Decisions.***

Errors have been discovered in several illustrations in *Psychological Tests and Personnel Decisions* by Lee J. Cronbach and Goldine C. Gleser, published by the University of Illinois Press in 1957. Corrected copies of Figures 16, 17, 18, 19, 20, and 29 have been prepared, and will be supplied on request. Write Bureau of Educational Research, 1007 South Wright Street, Champaign, Illinois.

# GOVERNMENT OF CANADA STATISTICAL ACTIVITIES

## Inter-Industry Flow of Goods and Services, 1949

The inter-industry flow table for Canada, 1949 published in 1956 has been revised to take into account revisions incorporated in Dominion Bureau of Statistics *National Accounts, Income and Expenditure, 1926-1956* which was published last year. The revised flow table is at producers' prices rather than purchasers' prices which were used in the earlier work. The new table is contained in Dominion Bureau of Statistics publication 13-513, *Supplement to the Inter-Industry Flow of Goods and Services, Canada, 1949*. This Supplement also contains the inverse matrix and calculations of the import and wages and salary content of the major categories of gross national expenditure together with tables giving supplementary information on exports and imports. The Supplement repeats the relevant descriptions of concepts, sources, and methods and is therefore a self-contained publication.

J. A. Sawyer,  
Research & Development Division—DBS

## External Short-Term Assets & Liabilities

A reference paper entitled *Canada's External Short-Term Assets and Liabilities 1945-1957* has been published by the Dominion Bureau of Statistics under Catalogue No. 67-504. Statistics of short-term commercial liabilities are provided making possible for the first time a schematically complete presentation of the Canadian

balance of indebtedness. Additional details include classifications of Canadian holders of foreign exchange and of international receivables and payables.

E. B. Carty,  
International Trade Division—DBS

## Dominion-Provincial Conference on Economic Statistics, October 5-7, 1959

A three day conference was held in Ottawa, at the Dominion Bureau of Statistics, in the month of October, at which D.B.S. officials discussed problems in the collection and use of economic statistics with provincial government statisticians and economists. Economists and statisticians from a number of federal government departments and agencies also participated in the discussions.

The recent conference was the third in a series. Previous meetings were held in 1953 and 1955. Discussions covered a wide range of topics, including co-operative arrangements for data collection and distribution, avoidance of duplication in surveys, and economic zoning. Considerable attention was paid to problems involved in providing a complete provincial classification for a number of series presently available only in the form of national aggregates, or on a broad regional basis.

Current D.B.S. activities and plans for the future were reviewed in considerable detail.

D. H. Jones,  
Research and Development Division—DBS

## Applied Statistics

ESTABLISHED EXPERIMENTAL and applied statistics section, presently expanding, has openings for candidates with:

1. Ph.D. or equivalent  
and
2. M.S., or B.S. with subsequent experience

Pharmaceutically oriented work includes both theoretical and applied statistics with emphasis in biological sciences. Positions will provide opportunities to do work with laboratory and/or clinical data. Frequent direct contact with scientists is encouraged.

The present group includes representatives of several statistical disciplines, as well as mathematically trained computing assistants. The section has a small-scale computer and will soon have available a medium-scale computer with magnetic tape facilities.

Liberal employee benefit program includes comprehensive health insurance and financial assistance toward further job-oriented education.

Please send detailed personal history, including salary requirement, to:

L. H. WATSON, *Employment Manager*  
Smith Kline & French Laboratories  
1518 Spring Garden Street  
Philadelphia 1, Pa.



# CONTENT OF THE 1959 U.S.S.R. CENSUS OF POPULATION

Morris B. Ullman

Foreign Manpower Research Office

U.S. Bureau of the Census

As of January 15, 1959, the Government of the U.S.S.R. conducted an All-Union population census. The last such census was conducted 20 years earlier, in 1939, but because of the war and for other reasons, the information published was very limited. The last previous census for which information was published in full detail was the 1926 Census of Population. The promised detailed publications for the 1959 census will thus be the most significant analytical data available on the population of this large and important country in 33 years.

Information on the planning and the taking of the 1959 census has reached this country in various forms. Reports have appeared in *Vestnik statistiki* on the Statisticians Conference in June 1957, which reviewed the plans for the census, on the pretest conducted in seven scattered areas in August 1957, and on the Statisticians Conference held in December 1958 to review the plans for tabulations. In addition, progress reports on the planning have appeared as articles in that and other Russian periodicals. The official decrees for the taking of the census also included the provisions for the census organization and instructions for filling out the questionnaires. Copies of these instructions were received by the U.S. Bureau of the Census from the U.S.S.R. through official channels. This information has been supplemented by reports in the Russian press at the time the census was taken in January.<sup>1</sup>

A description of the methods used for collecting the data, a copy of the questionnaire, and extracts from the instructions to the enumerators are given in a recent report of the U.S. Bureau of the Census (Series P-90, No. 10). The 15 questions asked for this census are shown in figure 1. In this paper, we shall review briefly the questions asked in the census, discuss the definitions used, and indicate some of the plans for tabulation and publication described by census technicians of the U.S.S.R. This summary, it is hoped, will indicate the kind of information that we may expect if the U.S.S.R. Central Statistical Administration carries out its plans.

## COLLECTION OF THE DATA AND FIELD COUNTS

The data for the 1959 census were collected in January

<sup>1</sup> In working with these materials, I am indebted to my colleagues in the Foreign Manpower Research Office of the U.S. Bureau of the Census, not only for the translation of the material into English, but also for extensive discussion and comments which were helpful in understanding the meaning and the setting of the material presented in this paper. Translations of the principal documents mentioned may be found in U.S. Bureau of the Census, *Materials on the Preparation and Conduct of the U.S.S.R. All-Union Population Census of 1959* (Bureau of the Census Working Paper No. 8), Washington, D. C., 1959.

Figure 1.—QUESTIONS ASKED FOR THE 1959  
U.S.S.R. CENSUS OF POPULATION

1. Relationship to the head of the family (wife, husband, son, mother, sister, nephew, etc.)
2. For the permanent resident, but temporarily absent, indicate: "Temporarily absent," and show length of absence
3. For the temporary resident, indicate:
  - (a) The place of permanent residence
  - (b) Length of absence from permanent residence
4. Sex (male, female)
5. How many years have elapsed since birth?  
For infants less than one year of age, how many months?
6. Is person married at present?
7. Nationality
8. Native language
9. Citizen of which country?
10. Education: Higher; higher, but not completed; secondary—specialized; secondary—general; 7-year schooling; primary.  
For persons of 9 years of age and older, without primary schooling, indicate: "Able to read and write;" or "Able to read only—in any language;" or "Totally illiterate."
11. For students, indicate the full name of the educational institution (institute, *tekhnikum*, school, college, name of courses) which person is currently attending.
12. Place of work (name of the enterprise, *kolkhoz*, institution); or works in one's own establishment.
13. Occupation at the above place of work (position, or work performed)
14. If without occupation as a source of income, show other source of the means of livelihood
15. Social group to which person belongs:  
Workers; employees; collective farmers (*kolkhozniks*); handicraftsmen, members of cooperatives; individual farmers; handicraftsmen, nonmembers of cooperatives; individuals of free professions; and clergy

by a staff of 500,000 enumerators, each of whom had a specific district to cover in 8 days. After his work had been checked by his supervisor, the enumerator prepared a summary of the persons he had enumerated, showing the numbers by sex, with those temporarily present and those temporarily absent shown separately. The number of persons 18 years of age and over was also to be shown. This summary, along with the reports gathered, were then turned over to his supervisor.

The supervisor then prepared a similar summary for the area for which he was responsible and turned it in to the census area chief, who again repeated the process and turned it over to his superior—the city or county (*rayon*) inspector. It should be noted that the enumerator districts had been so drawn that each populated place could be separately reported. Since each place was already identified as urban or rural, these totals could also be compiled in the summarization process.

The summaries and the census questionnaires were brought together in 57 coding offices. The totals at this stage were expected to be ready by April 25, 1959, which



was the target date for the Central Statistical Administration to report this information to the Council of Ministers. The data were made available to the public on May 10. They included the total population and the population of each Republic and other administrative area by sex and by urban-rural residence. The population of each city, town, and village was also available but was published only for the larger cities. Persons temporarily present as well as persons temporarily absent could be counted separately although the data shown are probably for population present. Data for the population 18 years of age and over were also summarized for each geographic area.

The total population of the U.S.S.R. announced on May 10 was 208,826,000 of which 48 percent was urban and 55 percent was female. About 70 percent of the population was located west of the Ural Mountains. The reported total was lower than expected on the basis of previously announced estimates and rates of growth. A full evaluation of the total must await the publication of additional detail.<sup>2</sup> An examination of the census plans reveals no obvious shortcomings but rather a strong emphasis on completeness of coverage.

#### GENERAL PROGRAM OF TABULATIONS

Meanwhile, the 57 coding offices were to proceed with the editing and coding of the questionnaires and the preparation of the punch cards. Punch cards and questionnaires were then to be sent to the central tabulating station in Moscow for checking and tabulation.

Tabulations were planned in three stages. The first stage includes the basic tabulations for small territorial units. Within each of the 4,000 counties (rayons), tables will be compiled for each town of 20,000 or more inhabitants, each urban settlement, and for the rural portion of the county. More limited tables will be prepared for the smaller urban places (under 20,000) and for each rural center and the larger rural populated points (over 5,000). The number of geographic units on the county level in this scheme is about 13,000. Hereafter, in this paper, we shall refer to this level of geographic detail as the county level. The planned date of completion for the first stage tabulation is the end of 1959.

The second stage of tabulation involves additional subject detail for certain information at the level of the oblast. This level is between the Union Republic and the county. The same detail will also be prepared at this stage for each Republic, kray, and oblast center, and each city with 100,000 or more inhabitants. The total number of units at this level of tabulation is about 370. We shall refer to this stage as the oblast level. Plans call for this stage of tabulation to be completed during 1960.

The third stage will involve more detailed tabulations for each of the smaller urban places, the rural county

centers and the larger rural villages (over 5,000 population). A detailed table (summary only) on age and national composition of families is also planned. This stage will be referred to as the detailed level. It is expected to be completed by the end of 1960.

At all stages, data will be summarized for each larger administrative area up to Republic and National totals. There will also be additional projects, such as the calculation of detailed life tables. This part of the program is planned for 1960-1961 and will not be discussed further here.

#### SUBJECT MATTER

##### Urban and Rural Residence and Sex

All tabulations will show the population by urban-rural residence and by sex. Urban and rural are defined in the U.S.S.R. according to their statements, on the basis of administrative criteria only. If the populated point is under the administration of a village soviet, it is rural; if it is administered by a city or workers settlement type of soviet, it is urban. However, the determination of the type of government, and thus of the urban status of the place, is a matter for determination at the Republic level. Because of this, the criteria for designating urban places may vary from Republic to Republic and sometimes even within the Republic. Some uniformity may be introduced by recommendations of the Central Statistical Administration, but these may not be fully adopted. As a very general pattern, however, urban places include those places with 2,000 or more inhabitants, most of whom derive their livelihood from non-agricultural sources.

The separation of all tabulations by sex is explained as making it possible to define in detail the role Soviet women play in the life of the country.

##### Population Used in Tabulations

With the answers to questions 2 and 3 on the questionnaire, the population reported is divided into three parts: (a) persons at their permanent place of residence, (b) persons temporarily present at the place of enumeration, and (c) persons temporarily absent from their place of permanent residence. The actual population (population present) at the time of enumeration is the sum of the first two groups. The permanent population of the area is the sum of the first and third groups.

For most tabulations, the base used is the actual population. For some topics, such as marital status and size of family, the base for tabulation is the permanent population.

##### Age

Tabulations will be made by single years of age for each larger urban settlement and rural place, as well as for counties. Persons aged 100 or more is to be shown as one group. When age is cross-classified with other characteristics, however, ages will be grouped and the groupings will vary according to the subject matter. This will be mentioned in discussing some of the subject tabulations.

<sup>2</sup> A report on the results in relation to other data is presented in the statement by John F. Kantner on "The Population of the Soviet Union" in *Comparisons of the United States and Soviet Economies*, Part I (pages 31-71), committee print of the Joint Economic Committee of Congress, Washington, 1959.

## Marital Status and Family Tabulations

The question on marital status required only that the person state whether he was married or not. In the enumeration, an entry of "widow" or "widower" was also permitted, but there were no plans for separate tabulation of this group. The totals for married persons will be tabulated for both the actual and the permanent populations by age. The age grouping used will show married persons 16-29 years old by single years of age, two 5-year groups to age 39, two 10-year groupings to age 59, then those 60 and over. At the oblast level, the married persons in the permanent population will be shown by age and social group and by age and nationality.

The oblast-level tabulation plans also include the distributions of the population by size of family, by social group, and by nationality. The family is defined as a group of related persons living together with a common budget, and provision has been made to show separately persons living away from their families. The planned family tabulations are considerably more detailed than those attempted in 1939, when a grouping of families by size for the total population was the only tabulation planned.

## Nationality

As asked on the questionnaire, the nationality reported is that which the respondent elects. In this form, the data should be comparable with 1939 figures but not with those of 1926. At the county level, the number of each nationality will be shown and employed persons will be separated by nationality groups in the summaries. There will be more extensive cross-tabulations at the oblast level, with such subjects as age, level of education and school attendance, occupation, and size of family. Nationality will also be shown in conjunction with native language. Some of the detail will be shown for basic nationalities only.

The age groupings by nationality will show the first 19 years by single years, from 20-69 years by 5-year groups, and from 70-99 years by 10 year groups.

The basic code list worked out by the Central Statistical Administration includes 126 nationalities and ethnic groups, 96 of which are indigenous or widely prevalent in the U.S.S.R. The number for which separate data will be shown is probably smaller.

## Native Language

The entry for native language will also be the one which the respondent elects for himself and need not correspond to his nationality. Nationality and native tongue will be cross-classified at the oblast level.

## Citizenship

The questionnaire asks for the citizenship of the person but this item is not included in any of the plans for tabulation. In 1939, non-Soviet citizens were separated from the others and tabulated separately, but it was stated that the results were added to the totals before publication.

## Educational Attainment

The question on literacy—ability to read and write—has been replaced by an expanded question on educational attainment. Where only two groups were shown in 1939—those who had completed a secondary education and those who had a higher education—the question in 1959 provides for six categories.

- (a) Higher education—completed
- (b) Higher education—not completed
- (c) Secondary specialized education
- (d) Secondary general education
- (e) Seven-year schooling
- (f) Primary schooling (4-year schooling)

Persons who had completed correspondence or evening schools were instructed to equate their attainment to the appropriate level in this scheme.

For persons 9 years of age or over who were in none of these categories, i.e., had not completed a primary school, the question on literacy was asked and entries were required as to whether able to read and write, whether able to read only in any language, or whether totally illiterate.

The age groups to be used for level of education start at age 9 and carry the data to age 19 by single years, from 20 to 69 years by five-year groups, and 70 years old and over as a single figure.

Educational attainment is to be cross-classified with age at the county level and in the county summaries for employed persons, by occupation, social group, and school attendance, as well as by industry. Tabulations at the oblast level are to be even more detailed and also to include information by nationality.

In Soviet statistics, the characteristics of the "intelligentsia" call for separate study. For dependents and those doing physical labor, inclusion in the intelligentsia depends on whether they fall in the first three groups listed above—those with a higher education, those with higher education—not completed, and those with secondary specialized education. These groups, together with the "white collar" workers (employees), form the "intelligentsia."

## School Attendance

Students were asked to state the full name of the educational institution they were attending, whether full-time or part-time. These institutions could then be classified into the following groups:

- (a) Higher educational establishments (including evening and correspondence programs)
- (b) General education schools of all types
- (c) Secondary specialized education establishments (including evening and correspondence courses)
- (d) Schools within the State labor reserve system (gostrudrezervy)
- (e) Other schools and courses

In the codes used in 1939, it was possible to separate those in evening and extension programs from those who

were regular students. It is not known whether this same separation will be made in the 1959 tabulations. No attempt was made in 1959 to get the year or grade that the person was attending, as was done in 1939.

At the county level, students will be classified by type of institution and age. At the oblast level, there will also be tabulations of school attendance by age, and the educational attainment by social group for the principal occupations and means of subsistence.

The age classification for school attendance is similar to that for educational attainment. Data for single years are shown from 7 to 19 years and by 5-year groups from 20-49 years. The last group is for those 50 years and over.

### Place of Work

From the name of the specific place of work entered in answer to question 12, a three-digit code has been provided to identify 75 industries or specific activities. These activities were grouped into 19 branches of the national economy, so defined that they could again be grouped into branches of so-called "material" production and nonproductive enterprise. This grouping is supposed to be similar to that used for current reporting of production and labor, although no specific 19-branch grouping of this type has been seen as yet in the published material.

For the nonworking population, an abridged grouping of eight branches of the national economy will be used—four branches of material production and four other branches—based on the place of work of the person on whom the respondent is dependent.

Persons employed in each of the 19 branches are to be tabulated by age, educational attainment, nationality, and occupation at least at the oblast level. For individual industries the age, educational attainment, and most important occupations will be shown.

The age distribution for industry and occupation data will show those under 15 years, 15, 16 and 17, 18, and 19 years, then from 20-59 years by 5-year groups, and those 60 and over.

### Occupation

The full list of occupations to be coded calls for 376 specific codes or about 100 more than was used in 1939 (261) or 1926 (279). The occupations are divided into 277 physical occupations and 99 "white collar" occupations. These are to be grouped further into 55 classes based on professional or functional activity. Apparently, further classifications based on degree of mechanization and level of skill were discussed, but probably will not be used because of the practical difficulties of establishing criteria for classification on these items.

Occupations of employed persons are to be tabulated at the oblast level by educational attainment and school attendance, as well as by age, nationality, and social group. Specified occupations will also be shown by industry.

### Means of Subsistence

For persons who report no occupation, the "means of subsistence" are reported in question 14. The means of subsistence may be derived from public sources, such as pensions or stipends; from private sources, such as rents or savings; he may be an inmate in a State-supported institution; or the person may be dependent on another individual. Thus, the occupation question, taken jointly with that on means of subsistence, will permit the classification of the population into groups according to source of livelihood as follows:

- (a) Employed persons
- (b) Members of families engaged in private subsidiary agriculture
- (c) Dependents
- (d) Pensioners
- (e) Recipients of stipends
- (f) Other dependents of public organizations (people in homes for the aged, wards in children's homes, inmates in homes for invalids, etc.)

Each of these groups is to be tabulated by age, educational attainment, school attendance, and nationality at the oblast level. Some of this information will also be available at the county level with a less detailed cross-classification.

### Social Group

Social group as reported in the census of the U.S.S.R. is quite different from the U. S. class of worker concept. The definition of social group can probably best be expressed by listing the 10 groups to be used, keeping in mind that this concept applies to the entire population. Dependents are reported in the same social group as the persons on whom they are dependent. Persons receiving pensions or stipends are placed in the social group to which they had belonged before the pension or stipend started. If those in the latter group had had no previous job, they were included in the group of the person on whom they had previously been dependent.

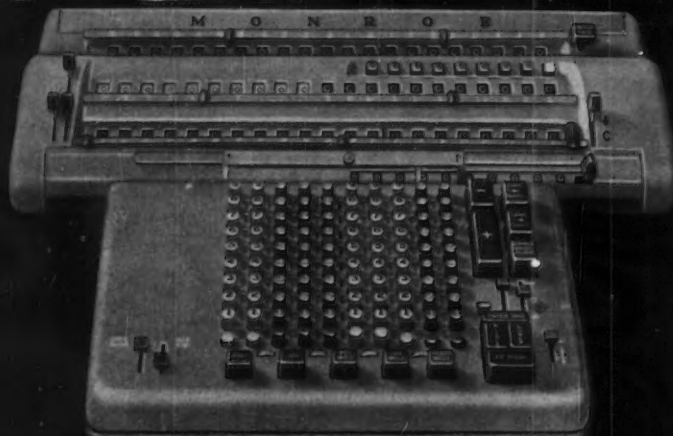
The social groups are as follows:

- (1) Workers (rabochiye)
- (2) Workers who are kolkhoz members
- (3) Employees (sluzhashchiye)
- (4) Employees who are kolkhoz members
- (5) Members of the kolkhoz who are not workers or employees, as well as members of their families engaged in private subsidiary farming
- (6) Handicraftsmen who are members of cooperatives
- (7) Individual peasants
- (8) Handicraftsmen not in cooperatives, including such persons as those working at a craft in their own home or engaged in hunting or fishing
- (9) Persons in the liberal professions, including those engaged in some form of intellectual activity, such as writers or physicians, who are not on the staff of any institution or enterprise
- (10) Clergy

(Continued on page 24)



$$\begin{aligned}
 N &= 6 \\
 \sum x &= 456 \quad \sum y = 590 \\
 \sum x^2 &= 35308 \quad \sum xy = 43401 \\
 m &= \frac{N \sum xy - \sum x \sum y}{N \sum x^2 - (\sum x)^2} = \frac{6(43401) - (456)(590)}{6(35308) - (456)^2} \\
 m &= \frac{-8634}{3912} = \boxed{-2.207}
 \end{aligned}$$



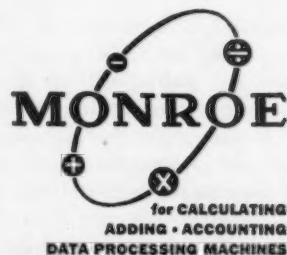
*For people who do the extraordinary with figures...*

## THIS IS THE MONROE CALCULATOR MADE FOR YOU!

This is the Monro-Matic 88N... strictly for figure sophisticates. It's the world's most advanced calculator... the *complete* calculator offering all the features you want and need.

- 1. AUTOMATIC DECIMALS**—You set all numbers—add, subtract, multiply or divide—around a single decimal point. Every answer is automatically pointed off.
- 2. MULTIFACTOR MULTIPLICATION**—Flick the transfer slide and the last product becomes the next multiplier. And you can follow multiplication or accumulation by division without re-entering the dividend.
- 3. "MEMORY DIALS" ACCUMULATION**—Products or quotients are accumulated automatically in the "Memory Dials" while the result of each individual problem appears in another set of dials.
- 4. SELECTIVE DIVISION**—You can divide directly into the "Memory Dials" accumulation for super-fast averages or determination of standard deviation.
- 5. AUTOMATIC CARRIAGE POSITIONING**—following a multiplication, the carriage automatically positions itself, decimally correct for addition or subtraction.

For information on the Monro-Matic 88N, the world's most advanced calculator, call your Man from Monroe today.



A DIVISION OF LITTON INDUSTRIES

Monroe Calculating Machine Company, Inc., Sales and service in principal cities everywhere. General offices, Orange, N. J.



# QUESTIONS AND ANSWERS

Edited by ERNEST RUBIN  
U. S. Department of Commerce  
and American University

## The Three Minute Mile

Apart from victory, winning or success, games of sport and chance as well as certain life situations produce a significant outcome element, namely record setting. In games of chance there is almost complete identification between winning and maximizing the gains. Many economic activities, which require a certain minimum profit to be regarded as successful, are pursued from the standpoint of maximum profitability. The educational system identifies not only the passing (or failing) grades of students but also singles out the exceptional students who achieve *cum laude* and better. Participants in the vast domain of sports are always seeking victory and are often striving for records.

Most sports records are of two types, either maximizing or minimizing a critical activity of the sport. In baseball there is an interest in such records of players as the "most runs batted in" or in the "earned run" average (least earned runs allowed) by pitchers. The record in golf relates to the least number of strokes required to complete a given course while the record in a bridge tournament refers to the highest number of points scored. In track events most of the records pertain to the least time in which a given distance can be run. The third type of record is the "first" time accomplishment, for example swimming the English Channel or scaling the Himalayas. For the most part sport records are statistical in character and if sufficient in number constitute informative time series.

Dr. Frank Holzman of the University of Washington examines the historical data on running the mile. The first record of this event was made in the nineteenth century. He suggests certain limits regarding the achievement time of future performances of this event. I wish to thank Dr. Holzman for an interesting and stimulating discussion.

\* \* \*

On May 6, 1954, Roger Bannister ran the mile in 3 minutes 59.4 seconds, the first human to break the "4 minute-mile barrier." Until recently it seemed that this race would go down in history, a landmark in sport even as Sir Edmund Hillary's conquest of Mt. Everest will never be forgotten. But already history has dimmed Bannister's great achievement. On August 6, 1958 young Herb Elliott of Australia ran an incredible 3 minutes 54.5 second mile followed by 4 runners all of whom bettered the time posted by Bannister in his historic race. The achievements of Elliott, Bannister and the 20-odd other runners, who belong to the sub-4 minute mile club, raises some interesting questions which we will attempt to answer below. Are the runners of today better than the great milers of the past, and if so, why? What is the limit to how fast the mile can be run? Is a 3 minute mile possible?

Answers to the second question have been suggested by eminent authorities. After Bannister and Landy ran their "mile of the century" at the British Empire Games in Vancouver in the summer of 1954, both men breaking 4-minutes, a well-known sports writer, overcome by their sensational performance, ventured to predict that when the two athletes retired from competition, the world might not see another 4-minute-mile for half a century. As we

## Discussion by Frank Holzman

all know, this prediction was rapidly refuted by events. In June 1957, an eminent doctor speaking before the American Medical Association, attributed the breaking of the "barrier" to the use of "pep pills" and drugs by athletes. Both of these individuals had obviously forgotten one of the first lessons of sports history—that records are made only to be broken. The super-athletes of today will always be outclassed by those of tomorrow.

Looking back a few decades for perspective, one finds the same excitement then over the 4:10 miles as attends the 4-minute-mile today. Who could say there was less amazement on July 15, 1933 when Jack Lovelock and Bill Bonthron both ran under 4:10 at Princeton, Lovelock to a record-shattering 4:07.6? Or in 1923 when Paavo Nurmi, stopwatch in hand, ran 4:10.4 and just barely missed breaking what was called in those days the "4:10 barrier?" Today, any one of the 20-odd milers who have raced under 4 minutes would have left the great Lovelock about 60 yards behind and the Phantom Finn still another 20 yards back. In fact, today, a college distance man who can't break 4:10 doesn't have much chance of winning a major race.

Let us return to our questions: Are Elliott, Bannister, Delaney and Landy greater runners than Cunningham, Nurmi and Lovelock? How can one explain the constant breaking of sports records? How fast can the mile be run?

The young men of today are undoubtedly better physical specimens than those of 25 and 50 years ago. The great advances in medical science and the rapid rise in standard of living in the United States and Europe have resulted in a bigger and stronger race. It is a matter of common observation that boys today grow to be taller than their fathers who in turn are usually taller than their own fathers. Since the turn of the century, the average American male has increased in height by at least two inches and in weight by more than ten pounds. It is impossible to measure the effect of this factor on athletic performance but there would seem to be little doubt that the effect has been salutary.

The rise in standard of living has resulted in improved performances also because today many more youngsters than ever before can go to high school and college and have the opportunity to compete in sports. It is hard to believe, but true, that the United States Olympic team which went to Paris in 1900 was composed almost exclusively of track stars from six major universities! Had Bannister, Landy and Cunningham been born fifty years earlier, they might never have donned spiked shoes! Even today, no doubt, many potential world record breakers remain undiscovered for lack of opportunity, never suspecting the ability hidden in their muscles. Re-

ports indicate that the Soviet Union is making a conscious attempt to locate such hidden talent by holding track meets and other sporting events throughout the country, including even relatively remote regions.

The tracks of today are "faster" than ever before. Improved methods of construction plus more money to spend are the factors responsible. The Los Angeles Olympic Stadium built in 1932 was heralded as the fastest track in the world. Within a few years it was superseded by the track at Palmer Stadium, Princeton. Hitler had a track built for the 1936 Olympic Games which was supposed to be faster than either of the American tracks. And so on. How many seconds are whittled off records by this factor is impossible to say. W. G. George, the great British miler, set a professional record of 4:12 $\frac{3}{4}$  in 1886 on a dirt track surfaced with brick dust. This record was unsurpassed for 29 years. It seems very probable, indeed, that George would have run faster than Nurmi's 4:10.4 (1923) or Cunningham's 4:06.7 (1934) had he been running on comparable tracks.

Changed techniques of training and running, while not as important in the mile as in other events, has certainly played a role in the march of records. In the high jump, for example, there has been a constant improvement in style. Before the turn of the century, most jumpers used the very elementary "scissors." This was quickly outmoded and until the early 'thirties most jumpers used the eastern roll, western side-roll or the triple-scissor of George Spitz. The western belly-roll was introduced and gained favor in the 'thirties. Its superiority has now been clearly established and it is rare to see a good jumper use any other method.

The shot-put has experienced a style-innovation over the past few years. Parry O'Brien, experimenting with a complete half-turn, has broken his own world record many times. The sprints certainly benefitted from the introduction of the crouch start. An old track chronicle records that "C. H. Sherrill of Yale, '89, was the first amateur of any note to try the crouching start. Sherrill was very unsteady on his feet (tended to break) and he tried the crouching position in the hope that he might remedy this defect. He never made a great success of it, however, and he returned finally to the old standing style." Sherrill originally tried the crouch start in an intercollegiate 100-yard championship race. The starter first thought he wasn't ready and then held up the race for several minutes in concern over the legality of the start. The newspapers reported that "Sherrill appeared to stumble at the start but recovered quickly and went on to win." Those were the days when running the hundred in "even time," that is 10 seconds flat, was the mark of the great sprinter.

The use of a standing start in the sprints is perhaps no stranger today than a practice which was somewhat prevalent in the longer runs. The New York Times, reporting the big British-American track meet in 1895 in which Kilpatrick set a new record for the 880, records that the British half-milers, all ran wearing straw hats! High feeling accompanied the big international track

meets at the turn of the century. The staid New York Times followed the description of each race an American won in the 1895 meet with the victory cry: The Eagle screams again!

The changes in technique in mile-running have been much less dramatic. Nurmi broke the record in 1923 by running the third quarter, usually far and away the slowest quarter of a mile race, almost as fast as the other quarters. Lovelock trained himself to follow a fast pace and still sprint the last 350 yards of a mile race. This carried him to his world record at Princeton and to an Olympic victory in Berlin in 1936. The success of recent assaults on the mile record must be attributed in part to the new technique used by milers for building up endurance. Previously milers developed endurance by running long distances—3, 5, 10 mile or longer jogs. Today the 4-minute-milers build up endurance by running 6 or 8 or more quarter-miles in rapid succession and at top speed. This method, introduced by the "swift Swedes," has the great advantage of developing speed and endurance simultaneously and is without doubt an important contributing factor to the incredible times turned in by the Swedish milers Haegg and Anderson in the 1940's and by the current crop of 4-minute-milers.

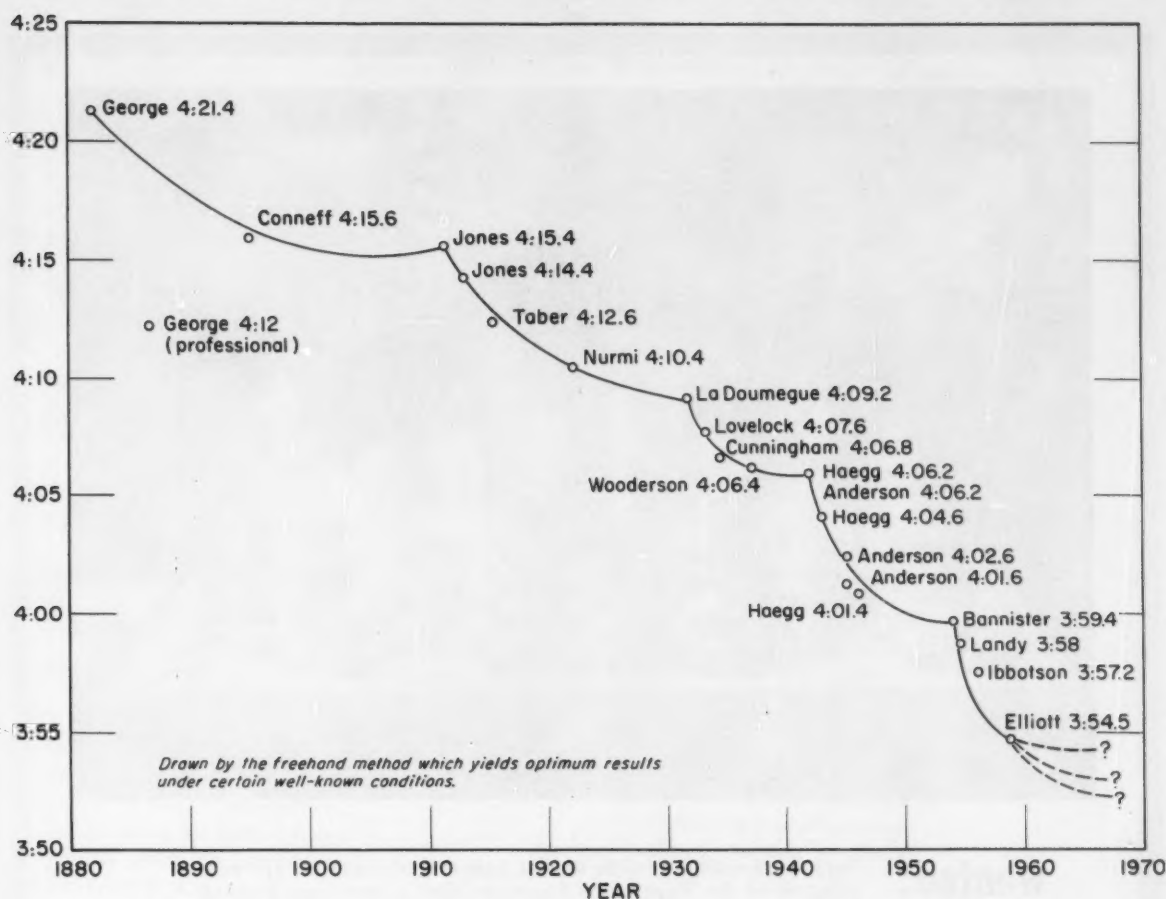
Last but not least is the psychological factor. It is much easier to achieve a certain time, height, or distance once it has been achieved by others. This is true of almost every event in sports although there are notable exceptions, Ruth's 60 homers for example. All other things equal, the knowledge that something *has* and therefore *can* be achieved is a most important piece of information to the performer. Look how long Landy tried and *just* failed to break 4 minutes before Bannister showed the way; and how many times he has run under 4 minutes since.

The key here is that fatigue and its effect on the body is to a very considerable extent affected by the mental outlook of the individual. This has been demonstrated by psychologists in experiments with both humans and animals. For example, a weight is tied to a subject's finger and he is asked to lift the weight repeatedly. Eventually the subject becomes fatigued and can no longer lift the weight even when urged to do so. A slight stimulus to the finger such as a pin prick or electric shock, something which provides the muscles with no energy, immediately restores the ability of the subject to lift the weight. In other words, the muscles were still capable of lifting the weight though the subject was unable to do so voluntarily.

Another example: subjects have been asked to write their names repeatedly until their hands are so tired that they can no longer hold a pencil. Urged to write their names once more, they are physically unable to comply. Asked, instead, to write their opinions on some interesting issue, and they are able to do so without difficulty. This indicates the importance of incentive or interest to fatigue.

Anyone who doubts the verity of the proposition that the effect of fatigue on the body is affected by the individual's mental outlook should ask himself why runners

# HISTORY OF RECORD-BREAKING IN THE MILE RUN



who collapse (for example, Bannister), do so 99 per cent of the time after, rather than before, they have crossed the finish line. Is it because they are able to calculate precisely how much energy they have and can plan to use it up just at the finish line? Or is it because they don't let themselves collapse until they have breasted the tape? Unquestionably the latter explanation is the correct one, though of course, a runner occasionally grossly overestimates the pace he can hold for a given distance, and does "run out of gas" before the finish. This should not be taken to imply either that there are no physiological limits to running speed or that an individual with no natural ability could outrun a talented athlete by simply refusing to give in to his tired muscles. Not at all. On the other hand, the performances of two athletes of equal strength and ability may differ substantially because of the psychological factor. And it seems quite clear that in almost all realms of sport the knowledge that a particular accomplishment is possible is important.

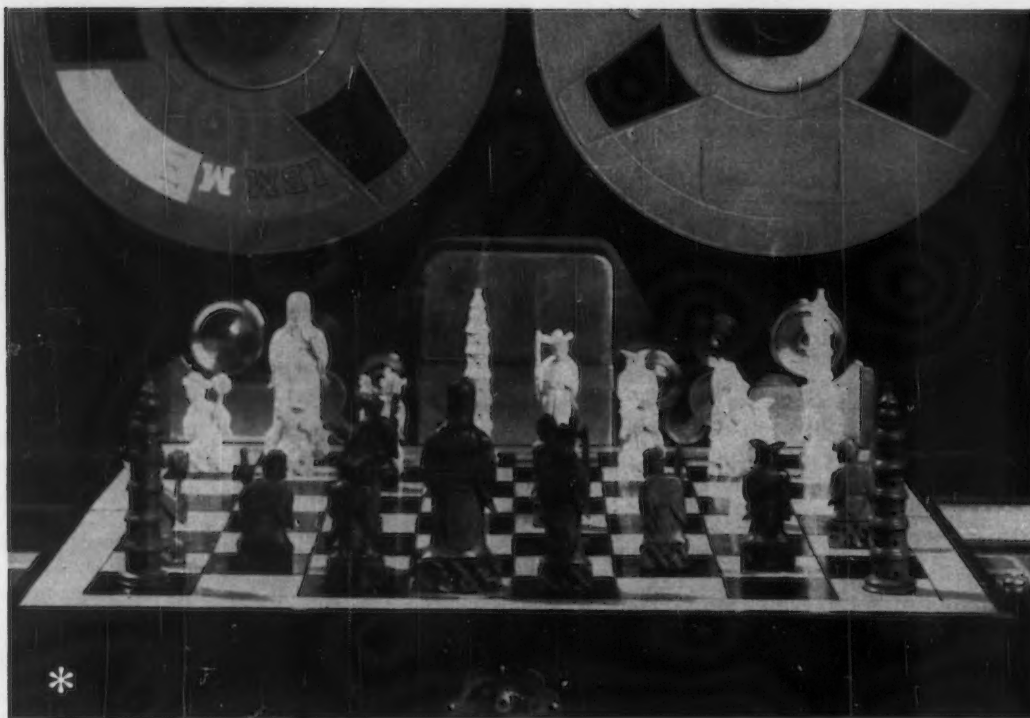
How fast *can* the mile be run? The mile record will undoubtedly be broken again and probably in the very near future. The above chart indicates that a tracing of the mile record over time results in a series of curves.

If history repeats itself, we would seem to be close to the bottom of a downward sweep. The reader can make his own choice as to which of the alternate curves indicated will best describe the course of the recordbreaking over the next ten years.

The absolute limit is more difficult to set because some of the basic factors responsible for improvements in running to date will continue to have an effect. The human race will continue to grow. Better tracks than those at Berlin, Princeton and Los Angeles will be built. New training techniques will probably be developed. The opportunity to engage in athletics will become more widespread. Each time a record is broken, the way will be paved psychologically to the next record. Perhaps the closest we can come to designating an absolute limit to the mile is to take the top speed of which man is capable and estimate how long it would take at this speed to run the mile. Top speed is probably attained in the second half of the 100 yard dash. By deducting the best time of 5.1 for 50 yards from the 9.3 record for the 100 yards, we arrive at a maximum speed of 4.2 seconds for 50 yards. This maximum is not likely to be improved upon

(Continued on page 27)





**wanted:  
WAR  
GAME  
PLAYERS**

Very large-scale air-battle digital computer simulations are now going on at the Washington Research Office of *tech/ops*. Present operations call for *top-flight mathematicians, mathematical statisticians, senior programmers, operations research analysts*.

These computer air battles are stochastic models which involve design and evaluation, and development of unusual techniques for studying sensitivity of these models to input changes. Associated activity involves design of advanced programming systems and of common language carriers which are expected to be independent of the first computer used—the computer itself augmenting and improving the language for use on later and more sophisticated computers.

If challenging work, stimulating atmosphere, and an opportunity to participate in an unusual company/employee investment program interest you . . . write or wire collect:

*Kingsley S. Andersson*

**Technical Operations, Incorporated**

3520 PROSPECT STREET, NORTHWEST • WASHINGTON 7, D. C.



\*Final position in the famed simultaneous exhibition at Pernau, 1910:  
Nimzovich (white) vs Ryckhoff (black).

## HIAWATHA DESIGNS AN EXPERIMENT

by

Maurice G. Kendall

1. Hiawatha, mighty hunter  
He could shoot ten arrows upwards  
Shoot them with such strength and swiftness  
That the last had left the bowstring  
Ere the first to earth descended.  
This was commonly regarded  
As a feat of skill and cunning.
2. One or two sarcastic spirits  
Pointed out to him, however,  
That it might be much more useful  
If he sometimes hit the target.  
Why not shoot a little straighter  
And employ a smaller sample?
3. Hiawatha, who at college  
Majored in applied statistics  
Consequently felt entitled  
To instruct his fellow men on  
Any subject whatsoever,  
Waxed exceedingly indignant  
Talked about the law of error,  
Talked about truncated normals,  
Talked of loss of information,  
Talked about his lack of bias  
Pointed out that in the long run  
Independent observations  
Even though they missed the target  
Had an average point of impact  
Very near the spot he aimed at  
(With the possible exception  
Of a set of measure zero.)
4. This, they said, was rather doubtful.  
Anyway, it didn't matter  
What resulted in the long run;  
Either he must hit the target  
Much more often than at present  
Or himself would have to pay for  
All the arrows that he wasted.
5. Hiawatha, in a temper  
Quoted parts of R. A. Fisher  
Quoted Yates and quoted Finney  
Quoted yards of Oscar Kempthorne  
Quoted reams of Cox and Cochran  
Quoted Anderson and Bancroft  
Practically in extenso  
Trying to impress upon them  
That what actually mattered  
Was to estimate the error.
6. One or two of them admitted  
Such a thing might have its uses  
Still, they said, he might do better  
If he shot a little straighter.
7. Hiawatha, to convince them  
Organized a shooting contest  
Laid out in the proper manner  
Of designs experimental  
Recommended in the textbooks  
(Mainly used for tasting tea, but  
Sometimes used in other cases)  
Randomized his shooting order  
In factorial arrangements  
Used in the theory of Galois  
Fields of ideal polynomials  
Got a nicely balanced layout  
And successfully confounded  
Second-order interactions.
8. All the other tribal marksmen  
Ignorant, benighted creatures,  
Of experimental set-ups  
Spent their time of preparation  
Putting in a lot of practice  
Merely shooting at a target.
9. Thus it happened in the contest  
That their scores were most impressive  
With one solitary exception  
This (I hate to have to say it)  
Was the score of Hiawatha,  
Who, as usual, shot his arrows  
Shot them with great strength and swiftness  
Managing to be unbiased  
Not, however, with his salvo  
Managing to hit the target.
10. There, they said to Hiawatha,  
That is what we all expected.
11. Hiawatha, nothing daunted,  
Called for pen and called for paper  
Did analyses of variance  
Finally produced the figures  
Showing beyond peradventure  
Everybody else was biased  
And the variance components  
Did not differ from each other  
Or from Hiawatha's  
(This last point, one should acknowledge  
Might have been much more convincing

If he hadn't been compelled to  
 Estimate has own component  
 From experimental plots in  
 Which the values all were missing.  
 Still, they didn't understand it  
 So they couldn't raise objections  
 This is what so often happens  
 With analyses of variance).

12. All the same, his fellow tribesmen  
 Ignorant, benighted heathens,  
 Took away his bow and arrows,  
 Said that though my Hiawatha  
 Was a brilliant statistician  
 He was useless as a bowman,

As for variance components  
 Several of the more outspoken  
 Made primeval observations  
 Hurtful to the finer feelings  
 Even of a statistician.

13. In a corner of the forest  
 Dwells alone my Hiawatha  
 Permanently cogitating  
 On the normal law of error  
 Wondering in idle moments  
 Whether an increased precision  
 Might perhaps be rather better  
 Even at the risk of bias  
 If thereby one, now and then, could  
 Register upon the target.

---

1959 U.S.S.R. CENSUS— CONTINUED FROM PAGE 17

The terms "workers" and "employees" as understood in the United States, only approximate the meanings of the Russian terms. In the Russian classification, these terms generally distinguish between those engaged in physical work and those whose tasks are primarily mental. For the census however, persons engaged in physical work were classified as employees if they were on the payroll of an establishment in the so-called "non-productive" sphere.

In 1939, an additional group "Nonworking individuals" was also shown but because of the comprehensive scope of the "Social Group" definitions, only about 60,000 persons, or less than 0.1 percent of the population, were classified as "non-working individuals" and it was decided that it was not necessary to show this group any longer.

At the county level, social group will be tabulated in conjunction with means of subsistence, branch of the national economy, and age. At the oblast level, there will be cross-classifications with age, nationality, educational attainment, school attendance, occupation, marital status, and size of family. In the case of the last two items, the tabulation will be for the permanent population.

The age classes for social groups will show single years of age from 14 to 19 years, 10-year age groups from 20 to 49 years, two 5-year groups for 50 to 59 years, and those 60 years of age and over.

Thus, tabulations of industry, occupation, and social group in combination and with other characteristics as outlined above, will give a picture of the labor composition of the population of the U.S.S.R. and its various administrative subdivisions. To quote the official (Pod'yachikh) who presented these plans to the Statisticians Conference on tabulations in December 1958, "It is expected to be able to determine the number

of men and women of working age and of those actually working; the number of nonworking students; the number of persons working in material production and in nonproductive branches of the economy; employment in material production by branch of the economy, industry, and occupation; the same group by State enterprise, by cooperative enterprise and the subsidiary economy of the cooperatives, by workers and by employees; employment in nonproductive branches by the type of enterprise servicing the day-to-day needs of the population; the scientific, administrative, and social apparatus; the size and characteristics of the Soviet "intelligentsia;" manpower resources which could be drawn into public production; and so forth."

#### SUPPLEMENTARY INFORMATION

Before completing the summary of expected information, mention should be made of the plan to provide additional data linked to the census. Apparently, the Central Statistical Administration conducts a periodic budget survey covering about 50,000 nonagricultural families. For October 1958, this survey was expanded to cover 230,000 families of workers and employees in nonagricultural fields, with the intention of linking the information obtained to the results of the census for January 1959, although the method of doing so was not specified. This linkage with the census will yield more data on family structure and earners, distribution of working time, income of families, expenditures for consumption items, and other information. A similar expanded budget survey to be taken after the census was also suggested, but there is no information at present as to what is actually being done, except that, beginning with January 1959, the Central Statistical Administration was to start a quarterly survey of 120,000 families of collective farmers to obtain family budget-type information.



# CONSTRUCTING SIMPLE CORRELATION PROBLEMS WITH PREDETERMINED ANSWERS

by

Bruce Edwards, *University of Illinois*

In a first course in statistics a teacher sometimes wishes to find a problem in which the standard deviations, standard error, correlation coefficient, correlation constant, and regression coefficient are all integers or decimal fractions. If the instructor is willing to use artificial data, the main difficulty is usually finding two series with these desired characteristics. Once these are found, it is a relatively easy matter to change the scale and origins to put the constructed data into the desired range. A method for constructing such problems is given in this paper.

## I

Using conventional notation let  $y$  be the dependent variable,  $x$  the independent variable and  $e$  the error. Since we will later shift the origins we can specify the averages  $\bar{x}$  and  $\bar{y} = 0$ . By definition  $\bar{e}$ , the average error, also  $= 0$ . Since we can later change both the absolute and relative scales of  $y$  and  $x$ , we can also specify  $\sigma_y = 1$  and  $b = 1$ . From  $b = r (\sigma_y/\sigma_x)$  we then get  $r = \sigma_x$ . The governing equations for the problem then become:

$$y_i = x_i + e_i \quad (1)$$

$$\sigma_y^2 = \sigma_x^2 + \sigma_e^2 \quad (2)$$

The second equation follows from squaring both sides of equation (1), summing over  $i$ , and dividing by  $N$ . Since by definition of least squares estimates the errors are uncorrelated with the independent variable,  $\Sigma x e = 0$ . From our previous assumptions that  $\sigma_y = 1$  and  $\sigma_x = r$ , equation (2) reduces to  $1 = r^2 + \sigma_e^2$ .

At this stage we can pick the desired value of  $r$ . If we want both the correlation and the standard error to be rational numbers our choice of  $r$  and  $\sigma_e$  is quite limited. For one digit answers one must be .8 and the other .6. A two digit possibility is .96 and .28. If we are not concerned with the standard error, then of course  $r$  may take any value between 0 and 1.

Once we have chosen the value for  $r$ , and hence for  $\sigma_e$ , we must choose  $N$ , the number of observations. This must be at least 4 and in practice should be 8 or more. Since  $\sigma_x = r$ , we then have

$$\Sigma x^2 = N r^2 \text{ and } \Sigma e^2 = N \sigma_e^2 = N (1 - r^2) \quad (3)$$

The values of  $\Sigma x^2$  and  $\Sigma e^2$  can be temporarily translated into integers by multiplying by an even power of ten. We can then proceed to construct the series for  $x$  and for  $e$  independently of each other. In number theory it can be shown that any integer can be expressed as the sum of the squares of not more than four other integers. Thus  $N - 4$  values can be chosen somewhat arbitrarily and the remaining four chosen to give the desired sum of squares.

The next step is to place signs on each value of  $x$  and  $e$  so that  $\Sigma x = \Sigma e = 0$  and the  $x$  and  $e$  values are paired

so that  $\Sigma x e = 0$ . These requirements are easier to state than to carry out.

If  $N = 8$  or more, the series can be divided in half, one half being determined as above and the other half being identical with opposite signs. If this is done with the  $x$  series, the  $e$  series should be chosen so that  $\Sigma e = 0$  for one half of the series, and the other half of the series is an exact duplicate with the same signs. This will satisfy the requirements that  $\Sigma x = 0$  and  $\Sigma e = 0$  and the pairing problem reduces to taking two identical  $e$  terms and pairing them with two  $x$  terms which differ only as to sign. Finally we finish the basic problem by constructing  $y_i = x_i + e_i$  for each pair of  $x$  and  $e$  values.

Once the basic problem is finished, it is simple to make it realistic. In the equation  $b = r (\sigma_y/\sigma_x)$  the value of  $r$  has now been determined. Of the remaining three, two are independent and the third is determined by the choice of the other two. Thus we can choose an arbitrary value for  $b$  and multiply the  $y$  series by it, getting a new series  $y''$ . Furthermore we can multiply both the  $x$  and the  $y$  series by an constant  $k$ , thereby changing the dispersion of the data but not affecting the ratio  $\sigma_y''/\sigma_x$ . Finally, add the desired mean of the  $x$ 's to each item in the  $x$  series and the desired mean of the  $y$ 's to each item in the  $y$  series. These are the final series to be used in the problem and they can be placed into a setting appropriate for the course being taught. If all of the steps in the above paragraph are combined in a single set of equations we have:

$$\text{the final } y \text{ series} = y'_i = b \cdot k \cdot y_i + \bar{y}'$$

$$\text{the final } x \text{ series} = x'_i = k \cdot x_i + \bar{x}'$$

where  $y_i$  and  $x_i$  are the series previously developed in the basic problem.

## II

### An Example

Making the earlier mentioned assumptions that initially all means are zero and that  $\sigma_y = b = 1$ , we can arbitrarily choose  $\sigma_x = r = .6$  and  $\sigma_e = .8$ . Then from equation (3) above

$$\Sigma x^2 = 12 (.36) = 4.32 \quad (4)$$

$$\Sigma e^2 = 12 (.64) = 7.68$$

Multiply by 100 to eliminate the decimal point and divide by two on the assumption that both series are to be symmetrical. Then our problem resolves to finding the items in the following two series:

$$x_1^2 + x_2^2 + x_3^2 + \dots + x_6^2 = 216 \quad (5a)$$

$$e_1^2 + e_2^2 + \dots + e_6^2 = 384 \quad (5b)$$

Since the procedures are identical for both series, we can temporarily ignore the error series and concentrate on series (5a). A trivial solution is for all values of  $x$

to be 6. This also shows that at least one value must be 6 or greater. At the other extreme,  $\sqrt{2-6} = 14^+$  so the largest possible value is 14. If  $x_1 = 14$ , then

$$\sum_{i=2}^6 x_i^2 = 216 - (14)^2 = 20,$$

and the remaining  $x_i \leq 4$ . This distribution, while technically permissible, would usually be considered too unrealistic. The solution is to try a smaller value for  $x_1$ . Let us try  $x_1 = 10$ . Then

$$\sum_{i=2}^6 x_i^2 = 116 \text{ and } x_2 \leq 10.$$

If we choose  $x_2 = 8$ , then  $\sum_{i=3}^6 x_i^2 = 52$  and  $x_3 \leq 7$ .

Up to this point we have been free in our choice of  $x_1$  and  $x_2$  so long as the remainder does not turn negative. Now we have only four numbers left and we are sure that there are some values that can be given to these numbers so that the sum of their squares equals the remainder (i.e. equals 52 in the example). In this particular case we can choose  $x_3 = 7$  and still fill out the series. If we let  $x_3 = 7$ , then  $x_4, x_5$ , and  $x_6$  must all be one; if we let  $x_3 = 6$ , we have  $x_4, x_5, x_6 = 4, 0, 0$ ; if  $x_3 = 5$ , we have either 5, 1, 1, or 3, 3, 3.

Note that we have practically no control over the values of  $x_4, x_5$ , and  $x_6$  once  $x_1, x_2$ , and  $x_3$  are chosen. Furthermore, if we had chosen  $x_1 = 9$  and  $x_2 = 8$ ,

$$\sum_{i=3}^6 x_i^2 = 71.$$

The only values of  $x_3, x_4, x_5, x_6$  which satisfy this requirement are (7, 3, 3, 2) or (6, 5, 3, 1). If  $x_3 = 8$  or  $x_3 = 4$ , it will be impossible to choose ( $x_4, x_5, x_6$ ) even though  $(x_1^2 + x_2^2 + x_3^2) \leq 216$ . In general for all cases which concern us here, if any of the  $x_i$  has an odd value, four of them must have odd values; the remaining two must both have even values, one and only one being divisible by four. If none of the values are odd, an even number of the  $x_i$  must have even values not divisible by four.

At this point two courses of action are open to us. The first course is to continue generating series on a trial and error basis until we have found one which suits us. The other choice is to systematically generate all possible series and then choose one for the problem at hand. If we follow this latter course of action and include only one permutation of each series, we have

at least 50 cases for  $\sum_{i=1}^6 x_i^2 = 216$  and 100 cases for

$$\sum_{i=1}^6 y_i^2 = 384.$$

Some of these are very uninteresting, such as (12, 6, 6, 0, 0, 0). In order to reduce the size of the list we may specify that only series containing six different values will be retained. If we wish a larger list we can specify that there must be five different values and that the repeated one must be small. The values for equations (5a)

and (5b) listed in Table I were selected in this manner.

From the collection of series in Table I we can arbitrarily select one for the  $x$  series in our problem. Lacking any better guide, we can pick one which is approximately normal. If we divide half of a normal curve into six parts, we find that each of the elements (11, 7, 5, 4, 2, 1) falls into one section. A twelve element  $x$  series is now constructed by using each element from the six element series once with a positive sign and once with a negative sign. Thus, the twelve element series is (-11, -7, -5, -4, -2, -1, 1, 2, 4, 7, 11). This is the first column in Table II.

In choosing the  $e$  series, it is necessary that

$$\sum_{i=1}^6 e_i = 0.$$

Hence the sum of the absolute values must be an even number and it must be possible to obtain half of that number by adding together two or three of the items in the series. Again lacking a better guide, we can choose an approximately normal series (15, 9, 7, 4, 3, 2). These numbers sum to 40, an even number, and can be divided into two halves (15, 3, 2) and (9, 7, 4) each summing to 20. The numbers in one half are given positive signs and those in the other half are given

number signs so that  $\sum_{i=1}^6 e_i = 0$ .

This produces the six element  $e$  series (15, -9, -7, -4, 3, 2).

Each element in the six element  $e$  series is now paired with an element in the six element  $x$  series in any manner we choose. It is usually not advisable to pair the largest error element with the largest  $x$  value as this will suggest curvilinear correlation. Having decided on the pairing, each signed element in the  $e$  series is paired with both the positive and the negative  $x$  elements which have the same absolute value. Thus  $e = -9$  is paired with both  $x = -5$  and with  $x = +5$ . See the first and second columns in Table II.

The next step is to construct the basic  $y$  series using equation (1). This is the third column in Table II. The  $b$  value is arbitrarily chosen to equal three and the fourth column obtained by  $y'' = b \cdot y$ . It would be possible, of course, to change the scale of the problem by multiplying both  $x$  and  $y''$  series (columns one and four) by a constant at this point. Finally the origins were shifted by adding the desired values of  $\bar{x}$  and  $\bar{y}$  (15 and 55 in the example) to each item in the respective series. This produces the two series  $x'$  and  $y'$  finally used in the problem, shown as the last two columns in Table II. All of the steps in this paragraph can be combined. They are separated in the example in Table II for purposes of illustration and checking. Since any errors made in constructing the problem will tend to be cumulative, the problem should be solved in its final form as a last check.

### Summary

The following summary is provided with the idea that

it might prove useful as an outline after several problems have been constructed. For the special case where  $N = 12$  and  $r = .6$  or  $.8$ , the values in steps 6 and 7 may be taken directly from Table I and the problem evolved from there.

To create a correlation problem with arbitrarily specified answers:

1. Choose a value for  $r$ . If the standard error is to be rational,  $1 - r^2$  must be a perfect square.
2. Choose an even number for  $N$ ,  $N \geq 8$
3. Choose  $D$  a power of ten sufficiently large to make  $D \cdot r$  an integer.
4. Compute  $S_x = N \cdot D^2 \cdot r^2$

Table I

Selected 6 Element Vectors With Integral Root Mean Squares

Root Mean Square = 6						Root Mean Square = 8					
11	9	3	2	1	0	17	9	3	2	1	0
11	7	6	3	1	0	17	7	6	3	1	0
11	7	5	4	2	1	17	7	5	4	2	1
10	9	5	3	1	0	15	11	5	3	2	0
9	8	6	5	3	1	15	10	7	3	1	0
9	7	6	5	4	3	15	9	8	3	2	1
						15	9	7	5	2	0
						15	9	7	4	3	2
13	6	3	1	1	0	15	9	6	5	4	1
13	5	3	3	2	0	15	8	7	6	3	1
13	5	4	2	1	1	13	12	6	5	3	1
12	7	3	3	2	1	13	11	9	3	2	0
12	6	5	3	1	1	13	11	8	5	2	1
12	6	4	4	2	0	13	11	7	6	3	0
11	8	5	2	1	1	13	11	7	5	4	2
11	6	5	5	3	0	13	10	9	5	3	0
10	9	4	3	3	1	13	9	8	6	5	3
10	7	5	5	4	1	12	11	9	5	3	2
9	8	7	3	3	2	12	11	7	6	5	3
9	7	6	5	5	0	12	10	9	7	3	1

5. Compute  $S_e = N \cdot D^2 (1 - r^2)$
6. Find  $N/2$  values of  $x_i$  so that

$$\sum_{i=1}^{N/2} x_i^2 = S_x/2$$

7. Find  $N/2$  values of  $e_i$  so that

$$\sum_{i=1}^{N/2} e_i^2 = S_e/2 \text{ and } \sum_{i=1}^{N/2} e_i = 0$$

8. Construct  $x_{(i+N/2)} = -x_i$ ;  $e_{(i+N/2)} = e_i$ ,  
 $i = 1 \rightarrow N/2$

9. Construct  $y_i = x_i + e_i$ ,  $i = 1 \rightarrow N$

10. Construct  $x'_i = \bar{x}_i + k \cdot x_i$ , where  $\bar{x}_i$  and  $k$  are arbitrarily chosen

11. Construct  $y'_i = \bar{y}_i + k \cdot b \cdot y_i$ , where  $b$  and  $\bar{y}_i$  are arbitrarily chosen

12. This will produce a problem  $y'_i = a + b \cdot x'_i$

Table II

A Correlation Problem

$x \text{ series} + e \text{ series} = y \text{ series}$			$y' = by = 3y$	$x'$	$y'$
-11	-7	-18	-54	4	1
-7	3	-4	-12	8	43
-5	-9	-14	-42	10	13
-4	15	11	33	11	88
-2	2	0	0	13	55
-1	-4	-5	-15	14	40
1	-4	-3	-9	16	46
2	2	4	12	17	67
4	15	19	57	19	112
5	-9	-4	-12	20	43
7	3	10	30	22	85
11	-7	4	12	26	67

$\Sigma x = 180$	$x = 15$	$a = 10$
$\Sigma x^2 = 3132$	$\sigma x = 6$	$b = 3$
$\Sigma xy = 11,196$	$r = .6$	$y = 10 + 3x$
$\Sigma y = 660$	$\bar{y} = 10$	
$\Sigma y^2 = 47,100$	$\sigma y = 30$	
$N = 12$	$\sigma e = 24$	

# THE THREE-MINUTE MILE—CONTINUED FROM PAGE 21

by more than one-fifth of a second. A mile run at this pace would be covered in 2 minutes 28 seconds. Such a pace could never be maintained for a full mile, of course; in fact, fatigue reduces a sprinter's speed over even as short a distance as 220 yards.

What would seem to be a more practical limit to the mile record over, say, the next 100 years? Projecting the trend in the chart into the distant future indicates that the record might be reduced to between 3:35 and 3:40 by the year 2050. As the ultimate speed is approached, however, some slowing down of the trend must be expected; and it would seem unlikely that 3:35 would

be beaten. This estimate is substantiated by another approach to the question. In the 1860's and 1870's when track records were first kept, the best time for the half mile was 1:56½. Elliott, when he set his record of 3:54.5, would have lagged by some 5 seconds a 2-man relay of the best half-milers of that period. As a crude guess, I would predict that when the year 2050 rolls around, the best runner of the day will be able to do between 3:35-3:40. That is, he will come within about 5 seconds of the best time in which the two best Olympic half-milers, Tommy Courtney and Derek Johnson, in relay are capable of running the mile today.



*Still Available—*

## The 1958 Proceedings of the Business & Economic Statistics Section of the American Statistical Association

... contains eighteen sessions with papers and discussions covering the major factors affecting the nation's economy. These topics were presented at the 118th Annual Meeting of the American Statistical Association, Chicago, Illinois, December 27-30, 1958. Paperbound; 384 pages, 8½" X 11" overall size.

### SESSIONS INCLUDE:

The Economic Outlook  
Statistical Analysis of Historical Data  
What Has Happened in Manufacturing since 1947?  
Major Economic Indicators: Canadian Experience  
Adequacy of Monetary and Financial Statistics for Business  
Cycle and Money Market Analysis  
Statistical Guides to Non-Inflationary Wage Bargaining  
Statistical Studies of the 1957-58 Recession and Recovery  
Methodological Problems in the Collection of Statistics of Research and Development Costs and Manpower

Quality Changes and Index Numbers  
Adequacy of the Statistical Foundation for Monetary Policy Formation  
How to Appraise Quantitatively the Effects of Government Economic Policy  
Estimating Federal Government Receipts and Expenditures  
Significance of Postwar Productivity Trends  
Regional Statistics  
Structure, Uses and Inadequacies of the Official Price Deflators  
Desiderata for the Basic Course in Economics and Business Statistics  
Recent Developments in Operations Research  
Contributed Papers

Price: to members, \$3.25; to non-members, \$3.75, *if remittance is sent with order*. An additional charge of \$.25 will be made for postage and handling on orders received without remittance.

### ORDER FORM

To: AMERICAN STATISTICAL ASSOCIATION, 1757 K St., N.W., WASHINGTON 6, D.C.

Please send me \_\_\_\_\_ copies of the 1958 Proceedings of The Business and Economic Statistics Section, @ \$3.25 per copy for members; \$3.75 per copy for non-members (if order is sent without remittance, \$.25 will be added to the invoice to cover postage and handling).

☐ Payment Enclosed.

☐ Bill Company.

☐ Bill Me.

NAME \_\_\_\_\_

COMPANY \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

ZONE \_\_\_\_\_

STATE \_\_\_\_\_

If you want a standing order, check here ☐

*You will automatically receive each yearly edition and be billed accordingly.*

# REPORT OF THE COMMITTEE ON PUBLICATIONS POLICY ON THE RESULTS OF THE PUBLICATIONS QUESTIONNAIRE

## I. History

The American Statistical Association has demonstrated a great continuity of interest in the field of publications. It is impossible to choose in a non-arbitrary fashion a recent date at which the history of the Questionnaire on Publications Policy should begin. Entirely arbitrarily, May 14, 1957, is chosen. This affords brevity as well as the inclusion of the principal events in the development of the questionnaire. Unfortunately, it necessarily excludes from the report the important work of many officers, members of the Association, and editors of its publications which, in a more complete narrative, could be shown to be of fundamental importance to recent events.

On May 14, 1957, the Board of Directors and William Leonard, then President of A.S.A., instructed the Committee on Publications to prepare a letter concerning publications policies. This letter was prepared and, on August 9, 1957, sent, over President Leonard's signature, to members of the Board, members of the Council (including the editors of the Association's two periodicals), and officers of the sections. Twenty replies had been received by September 9, 1957, when the Board and Council met during the annual meeting at Atlantic City, New Jersey.

W. S. Connor, Acting Chairman of the Committee, summarized the replies to President Leonard's letter for the Board and Council. The publications problems which were covered included various methods of partitioning the *Journal*, the appointment of Associate Editors of the *Journal* for each section, suggestions for changes in methods of refereeing articles submitted to the *Journal*, the consolidation of the *Journal* and *The American Statistician*, the consolidation of the *Journal* with section *Proceedings*, and numerous other matters.

The replies to President Leonard's letter were of great importance in the decision to inaugurate a broader survey of the opinions of the general membership of the Association. Two definite views arose. On the one hand, the several proposals indicated that there were areas in the A.S.A. publications program which a number of members thought required change and improvement. On the other hand, the diversity of views and the fact that only a minority favored most of the proposed changes offered no positive guides to the officers of the Association.

At the Atlantic City meeting in 1957, President-Elect Walter Hoadley, with the concurrence of President Leonard, asked the Committee on Publications Policy to present a detailed plan for a sample survey on publications policies to the Board at its first meeting in 1958. At the same time, William Connor asked to be relieved of his duties as Acting Chairman and Almarin Phillips was appointed Committee Chairman in his place. Mr. Connor continued to serve on the Committee.

When the Board and Council met in Washington on January 17, 1958, the Committee had prepared a draft of a questionnaire and, through the efforts of Mr. Earl Houseman, the Committee's sampling statistician, a preliminary design of the sample itself had been made.

The questionnaire and the design of the sample were thoroughly discussed at this meeting. One result was that the questionnaire was materially shortened. Some questions were deleted and a few were added. Wording was improved and the tentative sample size increased. Another result was that the Board and Council voted that the Committee should continue to work on the questionnaire—"to use its best judgment for the formulation of the questionnaire and . . . mail it at the earliest feasible date."

The questionnaire was revised several times in the following months. Members of the Committee made many changes. In addition, the Committee received valuable advice from questionnaire experts at the Bureau of Labor Statistics, the Office of Statistical Standards, and other polling organizations. The final form is included as an appendix to this report.

## II. The Sample and Response

The questionnaire was mailed to 1,736 members of A.S.A. and to 33 former members on September 1, 1958. Some consideration had been given to sending the form to all members, but this was rejected. The coding and processing of the returned questionnaire presented a formidable task even with the proposed sample. It would have been much greater with a complete

membership enumeration. It was also anticipated that a higher percentage return would be received if the members receiving the questionnaire realized that sampling was being used. If this were true, the amount of "follow-up" necessary for non-response would be materially reduced. In any case, the size of the sample seemed large enough for the purpose and at the same time, the additional costs of a complete enumeration were avoided.

The selection of the sample was based on known characteristics of the entire membership. Because of the large proportion of members belonging to the Business and Economic Statistics Section, the sample consisted of every sixth member of that Section, and every 2½ member who was not a member of that Section. The latter were chosen by picking up every second and every third member alternately. This process was carried through for each of the ten districts of the Association, APO and FPO addresses, foreign members, family members and institutional members. The 33 former members were chosen by selecting every fifteenth person in the 1956 and 1957 unpaid membership group. An individually addressed and signed covering letter accompanied each of the questionnaires sent to this group.

Nearly 900 returns had been received by the end of September. Follow-up letters were then sent to non-respondents. By early December, when coding and tabulation began, 1,274 responses had been received from 1,736 questionnaires sent to members. This is a response rate of about 73 percent. Replies were received from only 12 of the 33 former members queried.

## III. Results of the Questionnaire:

### A. Characteristics of Respondents:

The first six questions were asked to typify the respondents and to allow their being grouped into various classifications. In addition to this, it is possible to divide respondents by location because of the methods used in selecting the sample.

Exhibit I provides information on the respondents classified by area. Notice that the total card count appears as 2,188 rather than 1,274. That is because in the tabulation of this and subsequent tables the cards for responses of members of the Business and Economic Statistics Section were triplicated as a means of giving proper weight to the B & E membership. The ratio of the number of B & E respondents to the B & E membership was almost exactly 1/3 of the corresponding ratio for members other than B & E.

### EXHIBIT I

Distribution of Respondents by Area

Area <sup>a</sup>	Card Count	Percent of Total Respondents <sup>b</sup>
District 1	100	4.6%
District 2	133	6.1
District 3	375	17.1
District 4	147	6.7
District 5	325	14.8
District 6	98	4.5
District 7	164	7.5
District 8	297	13.6
District 9	124	5.6
District 10	195	8.9
Non-U. S. or Canada	171	7.8
Family and Institutional Members,		
APO-FPO Addresses and Other	59	2.3
Total	2,188	100.0%

<sup>a</sup>For District definitions, see A.S.A. District Map, Membership Directory, 1958, pp. x-xi.

<sup>b</sup>Items may not add to total due to errors in rounding.

If it is assumed that there are no significant differences in the response rates of the various areas—an assumption which is as yet untested—the regional break-down of Exhibit I represents the geographic distribution of the Association's membership.

Exhibit II gives information on the respondents by the length of time they had been members of the Association. It is rather

surprising that nearly a quarter were members for less than two years. The numbers involved, are large enough to assure a small sampling error and it is safe to assume that this percentage break-down represents the entire Association fairly accurately. Two hypotheses, or combinations of them, are possible concerning the relatively high proportion of new members. One is that the Association has been doing a good job of recruitment in the last few years and the large proportion is due to this factor. Another is that a large number of new members have historically dropped out of the Association after the first year or so. Considering that the total number of non-payments of dues was approximately 500 during the two years 1956 and 1957, the latter hypothesis seems plausible as at least a partial explanation. Certainly if the Association does have high mortality among new members, its publications policies must be involved. An analysis of the non-payments of dues cases would seem to be a priority item for further study.

#### EXHIBIT II

Distribution of Respondents by Number of Years of Membership in the Association

Years of Membership	Card Count	Percent of Total Respondents
Less than 2 years	506	23%
At least 2 years but less than 10 years	928	42
10 years or more	748	34
Non-response	6	(a)
Total	2,188	100%

(a) Less than 0.5 percent.

Exhibit III breaks down the respondents in terms of their interests in the five sections of the Association as indicated by answers to question 3. The proportions distributed to the five sections under "first choice" are clearly related to the division of total membership by sectional interest as indicated in the *Membership Directory, 1958*.

#### EXHIBIT III

Percentage Distribution of the Ranking of Sections According to Personal Interest of Respondents<sup>a</sup>

Section	Rank of Interest (high to low)					No Interest	Total
	1st	2nd	3rd	4th	5th		
Biometrics	12%	15%	12%	6%	4%	51%	100%
Business and Economic Stat.	52	12	9	5	2	20	100
Physical and Engineering Sci.	18	10	7	5	6	54	100
Social Stat.	15	29	11	6	4	35	100
Training	4	21	23	7	3	42	100
Total	100%	87%	62%	29%	19%		

<sup>a</sup> Items may not add to totals due to errors in rounding.

As is well known, the Business and Economic Statistics Section is the most populous in the Association. Looked at in another way, fewer members have no interest in this section than in any other. The Section on Physical and Engineering Sciences, to the contrary, ranks second in terms of the members who give it "first choice" but is also the section in which the largest number of respondents indicated no interest. It would appear that the sections in which statistics tends to be most technical (i.e., Physical Sciences, Biometrics) are those in which the largest number of members have no interest. The Section on Training, while the "first choice" of only a small number of respondents, ranks well as "second choice" and "third choice."

It is interesting that few members are actually interested in all of the sections. Only 87 percent of the respondents indicated a second choice, leaving 13 percent interested in but one section. As the rank of interest falls, an increasing percentage indicated no interest.

Exhibit IV summarizes the response to question 2. About 2/3 of the respondent and presumably the Association's membership—are employed in business and industry or government. Among

educational professional associations, A.S.A. may be unique in the large proportion of members whose principal engagement is *not* in education.

#### EXHIBIT IV

Distribution of Respondents by Source of Employment

Nature of Source of Principal Employment	Card Count	Percent of Total Respondents
Educator	504	23%
Government, other than educational	547	25
Private research or consulting organization	206	9
Business or industry	806	37
Labor union	4	(a)
Charitable institution	21	1
Student	57	3
Other	38	2
Non-response	5	(a)
Total	2,188	100%

(a) Less than 0.5%.

Exhibit V presents data on respondents distributed by the level of their most advanced college degree. While no testing has been attempted, it would appear that A.S.A., compared with other professional societies, has a relatively small proportion of members with doctor degrees.

#### EXHIBIT V

Distribution of Respondents by Most Advanced College Degree

Most Advanced Degree	Card Count	Percent of Total Respondents
No degree	105	5%
Bachelors degree	608	28
Masters degree	731	33
Doctors degree	744	34
Total	2,188	100%

Exhibit VI classifies respondents by the years in which their most advanced college degrees were obtained. The large proportion of respondents who received degrees in recent years is in accord with the high proportion of respondents who have become members of the Association during the same period as shown in Exhibit II.

Exhibit VII gives a percentage distribution of the fields represented by the respondents who indicated the degrees shown in Exhibit VI. The broad diversity of membership interests is again apparent.

#### EXHIBIT VI

Distribution of Respondents by Year of Receipt of Most Advanced College Degree

Year of Degree	Card Count	Percent of Total Respondents
Before 1920	62	3%
1920 thru 1929	162	7
1930 thru 1939	452	21
1940 thru 1949	508	23
1950 thru August 1958	879	40
No degree	102	5
Unknown	23	1
Total	2,188	100%

Exhibit VIII provides a summary of the responses to question 5. Only 407, or 18 percent, of the respondents indicated that their work in statistics was mathematical. A total of 202, or about 9 percent, were engaged primarily in the development of statistical techniques. Of these, 110, or 5 percent of all respondents, were doing mathematical development work.

The bulk of the respondents are users of statistics. Over 1100 were primarily engaged in applying statistics in other fields. More than 800 worked mainly in other fields which present occasions for the employment of statistics. Thus more than a



**EXHIBIT VII**  
Distribution of Respondents by Field of Most  
Advanced College Degree, Ranked from High to Low

Field	Percent of Total Respondents <sup>a</sup>	
Mathematics and Statistics		29.9%
Mathematics	11.7%	
Statistics	10.0	
Mathematical Statistics	6.0	
Experimental Statistics	2.0	
Actuarial Science	0.2	
Economics		22.4
Business and Commerce		9.8
Physical Sciences		6.2
Psychology		5.7
Sociology		5.1
Econometrics		3.7
Education		2.2
Health and Medicine		1.2
Biology		1.0
Agriculture		0.9
Sociometrics		0.3
Psychometrics		0.2
Other Social Sciences		1.3
Other fields		3.2
Fields not specified		2.2
No degree		4.7
Total		100.0%

<sup>a</sup>Items may not add to totals due to errors in rounding.

third of the respondents were not principally statisticians but rather found their main interests in other fields. The largest single block of respondents—and this represents only 32 percent—fell in application of statistics for general analysis in some applied field.

Question 6 was asked for several reasons, the most important being to find whether there was a particular journal or type of journal which a preponderant part of the A.S.A. membership regularly reads. Exhibit IX, which gives the results, is restricted to the journals in which respondents indicated greatest interest. The *American Economic Review* was mentioned most frequently, followed by the *Annals of Mathematical Statistics* and the *Journal of Marketing*. After these, the respondents' reading interests were spread widely over a large number of periodicals. Although not shown in Exhibit IX, this tendency toward diversity is still apparent when journals of subsidiary interest are considered. For example, a total of only 22 percent mentioned the *American Economic Review* when asked to list the most interesting eight journals or periodicals which they read regularly. Similar figures for the *Annals* and the *Journal of Marketing* are 17 percent and 11 percent respectively.

A break-down of Exhibit IX by sectional interests of the respondents is quite revealing. For example, 90 percent of the respondents indicating that the *American Economic Review* was the non-A.S.A. periodical of greatest interest selected the B & E Section as the section of greatest interest. Ninety-one percent of those choosing the *Journal of Marketing* selected the B & E Section. Looked at in another way, however, the interest indicated in these periodicals by B & E members is seen to be far from universal. Only 23 percent and 13 percent of the respondents who chose the B & E Section as the one in which they had the greatest interest selected the *American Economic Review*

and the *Journal of Marketing*, respectively, as the journals in which they were most interested. In addition, 72 percent of all the responses which mentioned no journal at all were from the 52 percent of total responses which selected the B & E Section as first choice.

*Biometrics* and the *Annals* were listed most frequently as first choice by those in the Biometrics Section. This Section accounted for 71 percent of the respondents giving *Biometrics* as first choice but only 12 percent of those placing the *Annals* first. Only 15 respondents giving the Biometrics Section as first choice mentioned no journals.

Of the respondents giving the Section on Physical and Engineering Sciences first preference, 23 percent mentioned the *Annals* as the journal of most interest; 20 percent chose *Industrial Quality Control* first.

The *Annals* was mentioned first by 26 percent of the respondents listing the Section on Training as first choice. No other journal was listed as the first interest choice by more than six respondents from this section.

In the Social Statistics Section, 18 percent of the respondents mentioned the *American Sociological Review* as of most interest. Only 9 non-members of this section mentioned this journal as most interesting. The *Annals* was listed first by 5 percent of the respondents from this section. Psychometrics was accorded first interest by 5 percent.

The responses to question 6 reaffirm the evidence from the earlier questions that A.S.A. membership is highly diverse. But they have interest beyond this. It is not clear at all that the less technical journals are of greatest appeal. A larger number of respondents picked journals and periodicals which are primarily statistical or mathematical as being of most interest than any other category. Even though the *American Economic Review* and *Journal of Marketing* ranked high in total respondents, they were selected mainly by B & E members and, relative to the large number of respondents in that section, even these periodicals appear not to be widely read. Within respondents from B & E, about 18 percent mentioned no journal. Corresponding percentages are 6%, 6%, 9% and 9% for the Biometrics, Physical and Engineering, Training, and Social Statistics Sections, respectively.

**B. Respondents Evaluation of the Journal of the American Statistical Association and The American Statistician:**

Exhibit X gives the total response to question 7. Taking the combined categories "Very Well" and "Adequately" to indicate those respondents who basically are not dissatisfied with the publications it is found that both are quite well received. Still, 8 percent of the respondents felt the *Journal* served the Association poorly or not at all and another 6 percent did not answer. Corresponding figures for *The American Statistician* are 13 percent and 9 percent.

Exhibits XI and XII break down the response to question 7 by the number of years the respondents were members of the Association. Significant differences appear. A larger proportion of new members feel the *Journal* meets the needs of the Association "very well" than is true of the oldest members. The reverse is true with respect to *The American Statistician*. It is among the older members that the *Journal* tends to be rated "poorly" or "not at all" while the reverse of this is not so clear for *The American Statistician*.

Exhibits XIII and XIV indicate the respondents attitudes towards the two publications when the section in which they

**EXHIBIT VIII**  
Distribution of Respondents by Type of Current Work With Statistics

Types of Work	Primarily in the development of statistical techniques		Primarily in the application of statis- tical techniques in one or more fields		Primarily in one or more applied fields which use statistics		Total	
	Card Count	Percent <sup>a</sup>	Card Count	Percent <sup>a</sup>	Card Count	Percent <sup>a</sup>	Card Count	Percent <sup>a</sup>
Mathematical	110	5%	233	11%	64	3%	407	18%
Collection and Tabulation	31	1	161	7	130	6	322	15
General Analysis	61	2	708	32	630	29	1,399	64
Other and non-response	—	—	—	—	—	—	60	3
Total	202	9%	1,102	50%	824	38%	2,188	100%

a. Items may not add to totals due to errors in rounding

## EXHIBIT IX

Distribution of Respondents by Journals and Periodicals of Greatest Interest to Respondents and Read by Respondents Regularly

Journal or Periodical	Card Count	Percent of All Respondents <sup>a</sup>	
Primarily Statistical and/or Mathematical:	727	33.2%	
Annals of Math. Statistics	175	8.0%	
Biometrics	97	4.4	
Industrial Quality Control	95	4.3	
Operations Research	70	3.2	
J. Royal Stat. Soc.	57	2.6	
Econometrics	42	1.9	
Biometrika	32	1.5	
Psychometrika	29	1.3	
Management Science	18	0.8	
J. of Assn. for Computing Machinery	18	0.8	
Applied Statistics	3	0.1	
Other Statistical or Mathematical Journals including Actuarial	91	4.2	
Primarily Business and/or Economics:	652	29.8	
American Economic Review	285	13.0	
Journal of Marketing	166	7.6	
Other Economics	107	4.9	
Other Business & Commerce	94	4.3	
Other Journals and Periodicals:	531	24.3	
American Sociological Review	66	3.0	
Science	17	0.8	
All Other in:			
Agriculture	5	0.2	
Biological Sciences	8	0.4	
Physical Sciences and Eng.	67	3.1	
Health Professions	66	3.0	
Education	8	0.4	
Sociology and Pol. Science	42	1.9	
Psychology	75	3.4	
Demography	26	1.2	
All other fields	146	6.7	
No Journal Mentioned	283	12.9	
Total	2,188	100.0%	

<sup>a</sup> Items may not add to totals due to errors in rounding

indicated most interest is considered. Members of the Section for Physical and Engineering Sciences are most prone to rank the *Journal* "very well" and least prone to give the same rank to *The American Statistician*. Only 6 percent of the respondents from the Physical and Engineering Section ranked the *Journal* "poorly", while 18 percent of them gave that score to *The American Statistician*.

## EXHIBIT X

Distribution of Respondents by Feelings as to How Association Publications Serve the Needs of the Association

Feeling as to How Well Publication Serves Needs of the Association	Publication		
	Journal of the American Statistical Association	The American Statistician	
Very Well			
Card count	740	615	
Percent of Respondents	34%	28%	
Adequately			
Card count	1,128	1,096	
Percent of Respondents	52%	50%	
Poorly			
Card count	173	245	
Percent of Respondents	8%	11%	
Not at All			
Card count	6	32	
Percent of Respondents	<sup>a</sup>	2%	
Non-Response			
Card count	141	196	
Percent of Respondents	6%	9%	
Total			
Card count	2,188	2,188	
Percent of Respondents	100%	100%	

<sup>a</sup> Less than 0.5%

## EXHIBIT XI

Distribution of Respondents by Feelings as to How the JOURNAL Serves the Needs of the Association by Number of Years a Member

Feelings as to how well Journal Serves Needs of Association	Number of Years a Member <sup>a</sup>		
	Less than two years	Two years but less than ten years	Ten years and over
Very Well	40%	34%	30%
Adequately	45	54	53
Poorly	5	8	10
Not at all	—	—	1
Non-response	10	5	6
Total: Percent	100%	100%	100%
Card count	506	928	748

<sup>a</sup> Items may not add to totals due to rounding errors.

## EXHIBIT XII

Distribution of Respondents by Feelings as to How THE AMERICAN STATISTICIAN Serves the Needs of the Association by Number of Years a Member

Feelings as to How Well American Statistician Serves Needs of Assoc.	Number of Years a Member <sup>a</sup>		
	Less than two years	Two years but less than ten years	Ten years and over
Very well	26%	23%	36%
Adequately	49	52	49
Poorly	10	15	8
Not at all	1	2	1
Non-response	14	9	6
Total: Percent	100%	100%	100%
Card count	506	928	748

<sup>a</sup> Items may not add to totals due to rounding errors.

## EXHIBIT XIII

Distribution of Respondents by Feelings as to How the JOURNAL Serves the Needs of the Association by Section of Most Interest

Feelings as to How Well Journal Serves Needs of Association	Section of Most Interest <sup>a</sup>				
	Biometrics	Bus. & Econ.	Phys. & Eng.	Training	Social Stat.
Very well	35%	31%	42%	35%	32%
Adequately	53	53	49	54	50
Poorly	5	9	6	5	9
Not at all	0	0	0	4	0
Non-Response	7	7	2	2	9
Total: Percent	100%	100%	100%	100%	100%
Card Count	255	1,127	386	81	320

<sup>a</sup> Items may not add to totals due to errors in rounding. <sup>b</sup> Less than 0.5%

## EXHIBIT XIV

Distribution of Respondents by Feelings as to How THE AMERICAN STATISTICIAN Serves the Needs of the Association by Section of Most Interest

Feelings as to How Well American Statistician Serves Needs of Assoc.	Section of Most Interest <sup>a</sup>				
	Biometrics	Bus. & Econ.	Phys. & Eng.	Training	Social Stat.
Very well	23%	31%	18%	33%	31%
Adequately	49	49	55	52	51
Poorly	14	10	18	12	7
Not at all	2	2	2	0	1
Non-Response	12	9	7	3	10
Total: Percent	100%	100%	100%	100%	100%
Card count	255	1,127	386	81	320

<sup>a</sup> Items may not add to totals due to errors in rounding.

Members of the Biometrics Section gave ratings in about the same pattern as did those in the Section for Physical and Engineering Sciences. Aside from these two sections, most of the differences in the feelings of members about the way the two periodicals serve the Association are not pronounced. In all sec-

tions except the Social Statistics Section, however, *The American Statistician* tends to get more "poorly" choices than the *Journal*.

It seems possible that some of the differences in the ranking by sections are associated with differences among the sections with respect to the number of years the respondents had been members of the Association and the levels of the most advanced college degrees received. Exhibit XV shows data on length of membership by section and Exhibit XVI gives the distribution of degrees by section. Some essentially non-probabilistic comments are in order. Respondents from the B & E Section had the largest proportion of members in the "ten year and over" category and also is tied (with the Physical and Engineering Sciences Section) for having the lowest proportion of members with doctors degrees. The Section for Physical and Engineering Sciences, while having a small proportion of doctorates, is relatively high in new members. The latter Section has the highest proportion of members with masters degrees, most of which presumably involved considerable study of mathematics and technical subject. And it is this section which gives the *Journal* the largest percentage of "very well" scores and *The American Statistician* the smallest percentage of "very well" scores. Somewhat strangely, the same section gives *The American Statistician* the largest relative number of "adequately" and the highest number of "poorly" counts. In the general picture, one gets the impression that the younger members in technical and mathematical fields rank the *Journal* highest and *The American Statistician* lowest.

#### EXHIBIT XV

Distribution of Respondents by Length of Membership by Section of Most Interest

Length of Membership	Section of Most Interest				
	Biometrics	Bus. & Econ.	Phys. & Eng.	Training	Social Stat.
Less than two years	21%	23%	26%	26%	21%
At least two years but less than ten years	44	40	49	47	44
Ten years or more	34	37	25	26	35
Length of membership unknown	1	0	0	1	0
Total: Percent	100%	100%	100%	100%	100%
Card count	255	1,127	386	81	320

Exhibit XVII throws further light on this aspect of rating the publications. The Exhibit is restricted to the *Journal* and compares only the "very well" and the "poorly" responses on the basis of the respondents current work with statistics. Looking at the row totals first, the most obvious finding is that the respondents who regard their work as mathematical rate the *Journal* "very well" significantly more frequently than do those working in collection and tabulation and general analysis. Within mathematics however, the results are not uniform. Those whose

#### EXHIBIT XVI

Distribution of Respondents by Most Advanced College Degree by Section of Most Interest

Most Advanced College Degree	Section of Most Interest <sup>a</sup>				
	Biometrics	Bus. & Econ.	Phys. & Eng.	Training	Social Stat.
No degree	1%	5%	5%	2%	7%
Bachelors degree	24	32	31	12	18
Masters degree	30	37	37	27	23
Doctors degree	45	27	27	58	52
Total: Percent	100%	100%	100%	100%	100%
Card count	255	1,127	386	81	320

<sup>a</sup> Items may not add to totals due to errors in rounding.

principal work is in applying mathematical statistics in other fields (the middle column) rate the *Journal* "very well" significantly more often than do those using it for development of techniques and those whose principal work is in applied fields which utilize statistics. Thus, by this classification, the *Journal* appeals most to a group which comprises a little more than 10 percent of the Association's membership.

The differences in the column totals are not as pronounced as those in the row totals. Those engaged principally in applied fields where the use of statistics is subsidiary rank the *Journal* lowest, as would be expected. The largest block of members fall in the general analysis—applying statistics to other fields category. Of the respondents in this group, 37 percent rate the *Journal* "very well", 87 percent rate it "adequately" or better and 8 percent feel that the *Journal* fulfills its purpose "poorly".

Exhibit XVIII presents the same information for *The American Statistician*. Again looking at row totals first, the collection and tabulation group appears to receive the publication best, but the differences between it and the other rows are now significant beyond one standard error. The mathematical group gave the largest percentage of "poorly" responses, but again the differences are not especially significant. In the column totals, the group working principally in the development of statistical techniques ranks *The American Statistician* "very well" significantly less often than do those in the other column categories. The best single cell is in the collection and tabulation—development of techniques group, though there are so few respondents in this cell that the findings are not very reliable. The worst single cell is the mathematical—development of techniques category.

The contrast between Exhibits XVII and XVIII is interesting. One of the main reasons for inaugurating *The American Statistician* was to appeal to members who might find little of interest to them in the *Journal*. Notice that the mathematics group rates the *Journal* "very good" most frequently and the collection and tabulation group rates it "very good" least frequently. With respect to *The American Statistician*, the results are just the opposite. Beyond this, the differences between the two tables are not systematic. There is no significant positive or negative correlation, based on Spearman's rank correlation coefficient, be-

#### EXHIBIT XVII

Comparison of "Very Well" and "Poorly" Answers as to How the JOURNAL Serves the Needs of the Association by Type of Current Work With Statistics

Type of Work	Primarily in the development of statistical techniques		Primarily in the application of statistical techniques in one or more fields		Primarily in one or more applied fields which use statistics		Total
Mathematical	Card count	110	Card count	233	Card count	64	407
	Very well	35%	Very well	52%	Very well	44%	46%
	Poorly	4%	Poorly	6%	Poorly	6%	6%
Collection And Tabulation	Card count	31	Card count	161	Card count	130	322
	Very well	35%	Very well	22%	Very well	25%	25%
	Poorly	0%	Poorly	4%	Poorly	8%	5%
General Analysis	Card count	61	Card count	708	Card count	630	1,399
	Very well	38%	Very well	37%	Very well	28%	33%
	Poorly	11%	Poorly	8%	Poorly	9%	9%
Total	Card count	202	Card count	1,102	Card count	824	2,128 <sup>a</sup>
	Very well	37%	Very well	38%	Very well	29%	24%
	Poorly	6%	Poorly	7%	Poorly	9%	8%

<sup>a</sup> Sixty respondents of the total of 2,188 either failed to answer question 6 or listed their current work in the "other" category.



## EXHIBIT XVIII

Comparison of "Very Well" and "Poorly" Answers as to How Well THE AMERICAN STATISTICIAN Serves The Needs of the Association by Type of Current Work With Statistics

Type of Work	Primarily in the development of statistical techniques		Primarily in the application of statistical techniques in one or more fields		Primarily in one or more applied fields which use statistics		Total
Mathematical	Card count	110	Card count	233	Card count	64	407
	Very well	18%	Very well	29%	Very well	33%	27%
	Poorly	14%	Poorly	18%	Poorly	14%	16%
Collection And Tabulation	Card count	31	Card count	161	Card count	130	322
	Very well	42%	Very well	34%	Very well	25%	31%
	Poorly	3%	Poorly	7%	Poorly	8%	7%
General Analysis	Card count	61	Card count	708	Card count	630	1,399
	Very well	24%	Very well	29%	Very well	28%	28%
	Poorly	10%	Poorly	10%	Poorly	13%	11%
Total	Card count	202	Card count	1,102	Card amount	824	2,128 <sup>a</sup>
	Very well	24%	Very well	30%	Very well	28%	28%
	Poorly	11%	Poorly	11%	Poorly	12%	12%

<sup>a</sup> Sixty respondents of the total 2,188 either failed to answer question 6 or listed their current work in the "other" category.

tween either the "very good" or the "poorly" entries in the two tables. Hence, aside from the differences pointed to above with respect to the mathematics and the collection and tabulation groups, it is not correct to assume that *The American Statistician* is popular with those who dislike the *Journal*, or vice versa. The safer conclusion is that the *Journal* is generally regarded as serving the Association better and, by and large, this is true irrespective of the types of work the members are doing.

Question 8 asked respondents if they usually read at least one article in each issue of the *Journal*. Question 12 asked the same information for *The American Statistician*. The questions themselves are not unbiased since an affirmative answer tends to be self-aggrandizing. They were asked mainly for check purposes, to see if those who had low opinions of the publications would answer "yes" or vice versa. Actually, the value of the questions as checks may have been lost since such a large percentage of respondents answered affirmatively in each case and since the proportion of "poorly" and "not at all" answers to question 7 was so small. Over-all, 85 percent of the respondents indicated they read at least one article in each issue of the *Journal* and 78 percent indicated the same for *The American Statistician*. Taken at face value, the difference between the two percentages is significant at the 1 percent level. However, if it is true that the questions are biased in favor of affirmative response, it may also be true that the bias is greater in the case of the *Journal*, due mainly to its more professional, more technical, character. It probably is not valid to draw any conclusions on the basis of the difference between the two figures alone.

Exhibit XIX breaks down the responses to these questions by length of membership in the Association. The results are consistent with those shown in Exhibits XI and XII where it was indicated that the *Journal* finds its greatest popularity among the newest members and *The American Statistician* among those who have belonged to the Association the longest. Staying within columns of Exhibit XIX should avoid differing degrees of bias in the questions. The difference between 89 percent and 81 percent, the first and last items in the *Journal* column, is significant. So is the difference between 79 percent and 84 percent in *The American Statistician* column. In the ten years or more row, where the difference in bias should work to reduce the difference shown, *The American Statistician* is apparently read more frequently than the *Journal*.

Exhibit XX gives information on the reading of the two periodicals by section of greatest interest. The results are in fair agreement with those shown in Exhibits XIII and XIV. Members of the Section for Physical and Engineering Sciences rate the *Journal* "very well" most frequently and *The American Statistician* "very well" least frequently in those exhibits. The same members have the highest proportion reading at least one article in the *Journal* and next to the lowest proportion reading an article in *The American Statistician*. Members of the Training Section have the smallest percentage usually reading an article in the *Journal*, yet tend to rate it "very well" and "adequately" quite frequently in assessing its service to the Association. Comparison between the three exhibits for the other three sections indicate no major discrepancies.

Question 8 asked respondents to check the various service sections of the *Journal* which they had used during the previous two years. Book reviews had been used by 87 percent of all respondents. The percentage is directly associated with length of membership, those belonging over 10 years reporting 91 percent and those belonging less than two years, 77 percent. Members of the B & E Section used book reviews least frequently (85%) while those in the Training Section used them most frequently (90%).

The lists of publications received were used by 29 percent of all respondent members belonging at least two years but less than 10 years used them most (31%) and members belonging less than two years, the least (27%). By sections, the Training Section was most prone to use the lists of publications, 40 percent of the members indicating use within the two year period.

## EXHIBIT XIX

Distribution of Respondents by Percent Usually Reading Publications by Length of Membership

Percent Usually Reading One Article In Each Issue			
Length of Membership	Journal	The American Statistician	Card Count
Less than two years	89%	79%	502
Two years but less than ten years	86	72	938
Ten years and more	81	84	742
Total: Percent	85%	78%	
Card count	2,182 <sup>a</sup>	2,182 <sup>a</sup>	2,182 <sup>a</sup>

<sup>a</sup> Six respondents of the total of 2,188 did not respond to the question asking length of membership.

## EXHIBIT XX

Distribution of Respondents by Percent Usually Reading Publications by Section of Greatest Interest

Percent Usually Reading One Article In Each Issue			
Section of Greatest Interest	Journal	The American Statistician	Card Count
Biometrics	89%	73%	255
Business and Economic Statistics	82	80	1,127
Physical and Engineering	96	74	386
Training	80	79	81
Social Statistics	83	80	320
Total: Percent	85%	78%	
Card count	2,169 <sup>a</sup>	2,169 <sup>a</sup>	2,169 <sup>a</sup>

<sup>a</sup> Nineteen respondents of the total of 2,188 did not indicate any section of greatest interest.

Ads of other periodicals were used by 23 percent of all respondents. New members used them least (27%) and those in the Association between two and 10 years used them most (31%).

Fifteen percent of those in the Social Statistics Section and 34 percent of those in the Section for Physical and Engineering Sciences used them.

Ads of publishers were used by more members than were ads of other periodicals. Thirty-two percent of the total had had occasion to use them. The pattern of length of membership is about the same as that for periodical ads. Members of the Physical and Engineering Section used publishers' ads most (42%) and members of the B & E Section used them least (28%).

The list of chapter presidents and secretaries was used least of all the service sections in the *Journal*. Only 12 percent had used this service in two years, with direct relationship between length of membership and frequency of use. There were no significant differences by section.

Summaries of papers delivered at the annual meetings, which appear in the *Journal* only once a year, were used by 66 percent of the respondents. Again, the members of longer standing use them more frequently (69%) than do the newest members (61%). Members of the Training Section used them most (72%) while members of B & E and the Physical and Engineering Sciences Sections used them least (66%).

Question 13 asked the same question about the service sections of *The American Statistician*. The "news about members" service was the most widely used, 55 percent of the respondents indicating use within the two years. The percentages of members for less than two years, those for two but less than 10 years, and those for 10 years or more using the service were 42 percent, 55 percent, and 63 percent respectively. Members of B & E used it least (50%) and members of the Training Section used it most (69%).

The Questions and Answers column was used by 54 percent of the respondents. The percentage was directly associated with length of membership, varying from a low of 45 percent for the newest members to 60 percent for the oldest. Members of the Biometrics Section and the Training Section used it most (63%) and members of B & E used it least (49%).

The section on Federal Statistical Activities was also used by 54 percent of the respondents and the direct relation between use and length of membership is again apparent. Here, however, the B & E members used it most (66%) and those in the Physical and Engineering Sciences Section use it least (28%).

The section providing A.S.A. news was used by only 36 percent of all respondents. The provision of this news was another of the main reasons for establishing *The American Statistician* and it is interesting that it is not more widely read. For comparison, it was found that 78 percent of respondents usually read an article in each issue, while the news section was used by only 36 percent in a two year period. As is true of all the service sections except publishers ads, use increases with length of membership.

Chapter notes in *The American Statistician* were used by 27 percent of the respondents. Publishers ads were used by 25 percent, significantly less than the percentage using such ads in the *Journal*. The list of chapter presidents and secretaries was used by only 11 percent of all respondents.

There were also differences in the use made of the service sections by type of current work with statistics. The most marked differences occur within the 202 respondents in the "development of technique" grouping. With respect to the *Journal*, those in the mathematical-development of techniques category made more frequent use of book reviews, list of publications received, ads of other periodicals and ads of publishers. Those in collection and tabulation-development of techniques used the same services less frequently. For *The American Statistician*, the mathematical-development of techniques cell had the highest percentage of use for news about members, news about A.S.A. activities, and ads of publishers. The general analysis-development of techniques group had the lowest use of news about members, questions and answers, chapter notes and listings of chapter presidents and secretaries.

Answers to question 10 indicated that 26 percent of the respondents had had articles accepted by journals published outside the A.S.A. in the preceding two years. Those from the Biometrics Section were highest with 48 percent reporting such articles. Members from the Social Statistics, Training, Physical and Engineering Sciences, and B & E Sections followed with 42 percent, 37 percent, 30 percent, and 15 percent, respectively.

Questions 9(c), 10(b), 11, 13(c), 14, and 15 allowed respondents to amplify their answers to other questions and to make remarks and suggestions. Approximately 32 percent of the respondents wrote some comments, requiring 694 cards (including

the duplicate cards introduced for weighting) as compared with the total card count of 2,188.

Coding was very difficult. The locations of comments on the questionnaires frequently failed to correspond to the locations of the questions calling for the comments. It was usually possible to code comments into two fields, one for those pertaining to the *Journal* and one for those related to *The American Statistician*. In some cases, however, even though the respondent was obviously referring to one or the other, it was impossible to tell which. These and comments dealing with other aspects of the Association's publications program were coded in an "Other" category.

Exhibit XXI summarizes the comments received. Interpretation of these results is somewhat perilous because of the "open endedness" of the questions. The responses were highly diverse and the coding necessarily involved an arbitrary classification of heterogeneous answers into relatively homogeneous categories.

#### C. Responses by Former Members of the Association:

It was mentioned above that only 12 of the 33 former members to whom questionnaires were sent responded. With this small number even quite consistent and systematic replies would present difficulties in drawing comparisons. Actually, however, there is little about the 12 that suggests they are different from those who are still members. Three were members for less than two years, six, two but less than 10 years, and three, 10 years or more. Four were employed as educators, four in business and industry, three in government and one in private research or consulting. Three each belonged to the Biometrics and B & E Sections, four to the Social Statistics Section, and two to the Section for Physical and Engineering Sciences.

Seven of the former members had bachelors degrees as their most advanced college degrees. Three had received doctorates and the remaining two had masters degrees. Six had received these degrees between 1940 and 1949, three since 1950, and three during the 1930's.

The former members were not concentrated in a particular kind of work. Two regarded their work as mathematical, one in the development of techniques, another primarily in an applied field which uses statistics. Four fell in the collection and tabulation group, three of whom were primarily applying statistical techniques in another field and one who was mainly working in an applied field which occasioned the use of statistics. The remaining six were in general analysis, five principally in an applied field and one principally applying statistical techniques.

The *Journal* and *The American Statistician* were scored well by the former members. Three indicated they thought each of the periodicals served the Association "very well", six rated them "adequately", none gave a "poorly" or "not at all" reply, and there were three non-responses.

Ten of the 12 former members said they usually read at least one article in each issue of the *Journal* during the time of their membership. Eleven indicated they had usually read an article in *The American Statistician*. Four of this group had had articles published in other journals during the preceding two years. The written comments on other questions were particularly non-revealing as to why the Association had failed to retain the memberships.

#### IV. Concluding Comments

This report has been limited to a survey of the results of the questionnaire. No attempt has been made to translate these results into policy recommendations. The Committee on Publications Policy will transmit to the Board and Council a set of policy recommendations before the end of the year. It is not, however, premature to make a few remarks.

The questionnaire was aimed at uncovering the sources and intensity of criticisms concerning the Association's publications. There was provided an ample opportunity for any respondent to vent whatever feeling he may have had. By and large, the impressive thing about the questionnaire results is the infrequency with which extremely critical replies were received. Perhaps the A.S.A. membership is just too polite to complain, but this seems unlikely. Publications, whether newspapers, magazines or professional journals, come to have a reputation, even by those who do not read them. In general, criticism of them is free-floating and unrestrained while praise, however merited, is not expressed.

Even if the foregoing is true, there remains a problem of better fulfilling the individual needs of the members of the Association. The present publications may serve the Association well, yet leave large groups of individuals without recourse to the types of

# EXHIBIT XXI

## Nature and Frequency of Written Comments

Nature of Comments	Card Counts		Other
	Journal	Am. Stat.	
Not useful or of no interest to member	8	26	
Add section on position vacancies	23	53	
Beter indexing, long term index needed, index by subject matter, index of book reviews	26	4	
Journal not unified, too haphazard, not consistent as to depth, heterogeneous collection	5	7	
Limit Journal to technical articles and make Am. Stat. a service or news medium only	7	32	
Should have 2 or more journals, increase technical content of Am. Stat., sectionalize the Journal	40	7	
Drop the Am. Stat. and include parts of it in Journal		49	
Articles are too mathematical, write-down for non-mathematical reader, more elementary articles	173		
Favorable comments on technical level, retain at about present technical level to more technical	16		
Too many articles on bus. & econ. stat., too many articles that do not involve statistical methods, too many articles on government statistics	39	2	
Too many articles of low quality	13	1	
Journal too dull, needs to be enlivened, too rehashing of old ideas	15	3	
Make provision for "Letters to the Editor"	11	7	
More abstracts of articles in other journals	47	3	
Add section on statistical activities in various countries, make more international in scope	6	9	
Expand Question and Answer Section	7	38	
Expand news to give better coverage of developments in industry, education, data processing, the role of the statistician, etc.	4	70	
More news about members, field of specialization, where they are working, etc.	11	5	
Expand book reviews, improve quality	35		
Shorten or drop section on Federal Statistical Activities	3	27	
Drop Publications Received	22	2	
Drop section on chapter notes	2	23	
List chapter officers in either Journal or Am. Stat., list in only one issue per year	42	20	
Too much delay in processing manuscript, referees don't agree, other objections to editorial situation	22		
More adequate summaries of articles		25	
Publish membership directory more often		35	
News items too late		13	
Better coverage of papers presented at annual meetings		31	
Monthly or bimonthly publication of the Journal	17		
Summary of colleges offering graduate work in statistics, special summer sessions, fellowships, etc.		11	
More articles:			
on electronic computing	10	5	
in physical sciences and engineering	36	13	
on applications in management, accounting, administration	22		
on application and use, expository articles, unifying theory and practice	89	10	
of a general review nature, that summarizes a field of statistics, that review new statistical techniques, symposia	64	10	
on design of experiments	10		
on business, economics, forecasting, sociology	57	7	
in field of psychology and human behavior	12	1	
in other specific fields of application	41		
More monographs			12

statistical materials which they would like to assuage their own intellectual curiosity. Part of this problem, of course, is due to varying levels of technical competence. But the results of the questionnaire suggest that it is more a matter of different fields of interest. It is conceivable that one or two journals could fairly well run the range of technical competence if that were the only

problem. It is quite another matter to suggest that one or two journals could cover the range of fields in which A.S.A. members are primarily interested. Most of each issue would not be of interest to every reader if this were attempted.

## Committee on Publications Policy \*

Lyle D. Calvin  
William S. Connor  
Harold F. Dorn  
Bernard G. Greenberg  
Morris Hamburg  
Frank A. Hanna  
Earl E. Houseman  
J. Stuart Hunter  
John W. Lehman  
John Neter  
Donald C. Riley  
W. Allen Wallis  
Almarin Phillips, Chairman

\* Mr. E. T. Weiler was a member of the Committee until January, 1959.

## MARKET RESEARCH ANALYST

Combination Statistical, Mathematical, Economic Analysis within a progressive pharmaceutical market research division. Sales forecasting and area sales quotas along with general market research. IBM 610 available and interest in computer use is desirable. Recent graduate of Master's degree program preferred. Location: Indianapolis, Indiana. Address resume or inquiries to:

**Personnel Requirements**  
**Eli Lilly & Company**  
**230 East McCarty Street**  
**Indianapolis, Indiana**

## OPERATIONS RESEARCH INDUSTRIAL USES

A leading national organization with headquarters in New York City is seeking demonstrated professional competence in applying operations research methods to actual diversified management problems. We require direct experience in model building and optimization and a strong background in both mathematics and statistics.

This is a new position with an organization establishing a realistically oriented operations research function. The position calls for independent research and creative work with a minimum of technical supervision. Excellent opportunities for advancement and professional development.

Send complete resume indicating past earnings and present salary requirements. Our employees know of this advertisement.

**Address Box 600**  
**AMERICAN STATISTICAL ASSOCIATION**  
**1757 K St., N.W.**  
**Washington 6, D. C.**



# APPENDIX

(Condensed From a Six-Page Form)

## Questionnaire on Publications Policy

1. Indicate the number of years you have been a member of the American Statistical Association by checking the appropriate box:

- ☐ two years or less  
☐ more than two but less than ten years  
☐ ten years or more

2. Check the most appropriate description of the nature or source of your principal employment:

- ☐ Educator  
☐ Federal, state or local government other than educational  
☐ Private research or consulting organization  
☐ Other (please specify) \_\_\_\_\_
- ☐ Business or industry  
☐ Labor union  
☐ Charitable institution  
☐ Student

3. Rank the sections of the Association according to your personal interest in them. Indicate the section of most interest to you by placing a 1 on the appropriate line; the section of next greatest interest by 2, etc. Leave blank lines of any sections in which you have no personal interest:

- \_\_\_\_\_ Biometrics Section  
 \_\_\_\_\_ Business and Economics Statistics Section  
 \_\_\_\_\_ Section on Physical and Engineering Sciences  
 \_\_\_\_\_ Section on Training in Statistics  
 \_\_\_\_\_ Social Statistics Section

7. Indicate your general feelings as to how well *The Journal of the American Statistical Association* and *The American Statistician* serves the needs of the Association:

	Very Well	Adaptively	Poorly	Not at all
<i>Journal of the American Stat. Ass'n.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>The American Statistician</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

8. Do you usually read at least one article in each issue of *The Journal of the American Statistical Association*?

- ☐ Yes ☐ No

9. (a) Indicate which of the following service sections of the *Journal* you have used during the past two years:

- ☐ Book Reviews  
☐ Publications Received  
☐ Advertisement of Periodicals
- ☐ Advertisements of Publishers  
☐ List of Chapter Presidents and Secretaries  
☐ Summaries of Papers Delivered at Annual Meetings

(b) Do you feel that any of the service sections of the *Journal* should be dropped, contracted, or expanded or that others should be added?

- ☐ Yes ☐ No

(c) If your answer to 9 (b) is yes, please explain:

4. Indicate the year and the major field of your most advanced college degree. If you have no college degree, indicate "None":

Degree \_\_\_\_\_ Year \_\_\_\_\_  
 Field \_\_\_\_\_

5. Indicate your current interests in statistics by checking the one box which best describes your work with statistics:

- Primarily in the development of statistical techniques  
 Primarily in the application of statistical techniques to other or many fields  
 Primarily in use of more applied fields which use statistics
- Mathematical ☐ ☐ ☐  
 Collection and tabulation ☐ ☐ ☐  
 General analysis ☐ ☐ ☐  
 Other (please specify) \_\_\_\_\_

6. Indicate the names of professional journals and periodicals other than those of the American Statistical Association to which you subscribe or read regularly in the order of your interest in them:

1. \_\_\_\_\_  
 2. \_\_\_\_\_  
 3. \_\_\_\_\_  
 4. \_\_\_\_\_  
 5. \_\_\_\_\_  
 6. \_\_\_\_\_  
 7. \_\_\_\_\_  
 8. \_\_\_\_\_

10. (a) Have you had articles accepted by other journals in the past two years?

- ☐ Yes ☐ No

(b) If your answer to 10 (a) is yes, please specify the other journal(s) involved and tell why it (they) were selected for publication instead of the *Journal*:

Name of Journal	Reason for Selection
_____	_____
_____	_____

11. Please use this space for any suggestions you have for improving the *Journal*. (Further comments with regard to other questions herein may be entered on the last page of this form.)

\_\_\_\_\_

12. Do you usually read at least one article in each issue of *The American Statistician*?

- ☐ Yes ☐ No

13. (a) Indicate which of the following service and news sections of *The American Statistician* you have used during the past two years:

- ☐ News of ASA elections and activities  
☐ Federal Statistical Activities  
☐ Questions and Answers  
☐ News About Members
- ☐ Advertisements of Publishers  
☐ Chapter Notes  
☐ List of Chapter Presidents and Secretaries

(b) Do you feel that any of the service and news sections of *The American Statistician* should be dropped, contracted, or expanded or that others should be added?

- ☐ Yes ☐ No

(c) If your answer to 13 (b) is yes, please explain.

\_\_\_\_\_

14. Please use this space for any suggestions you have for improving *The American Statistician*. (Further comments with regard to other questions herein may be entered on the last page of this form.)

\_\_\_\_\_

15. Please use this space for any additional comments or suggestions concerning the publications (i.e., the *Journal*, *The American Statistician*, the Membership Directory, Monographs, the *Proceedings of the Business and Economic Statistics Section*) and publications policies of the Association:

\_\_\_\_\_

## NEWS ABOUT MEMBERS

**Howard B. Baltz** is a Graduate Assistant at Oklahoma State University, beginning work toward a Ph.D. in Economics and Statistics.

**Gertrude Bancroft**, formerly with the Population Division of the Bureau of the Census, has transferred to the Bureau of Labor Statistics as Assistant Chief for Employment and Labor Force Analysis in the Division of Manpower and Employment Statistics.

**Richard E. Beckwith** has joined the Aeronautic Division of the Ford Motor Company at Newport Beach, California, as Supervisor of their Operations Research Section. He was formerly Senior Research Engineer at the Jet Propulsion Laboratory, California Institute of Technology.

**Bernard R. Bell** has joined the staff of Surveys and Research Corporation, Washington, D. C. Mr. Bell, who was formerly Chief Economist, Export-Import Bank of Washington, will direct the Economic Consulting Research Services of the firm.

**William M. Blake** is a Group Insurance Underwriter with the Prudential Insurance Company of America.

**R. C. Bose** has joined the Case Institute of Technology, Cleveland, Ohio, as a Visiting University Professor in Statistics. Dr. Bose is on leave of absence from the University of North Carolina.

**Donald B. Brout** has joined the Management Services Department of Arthur Young and Co. in New York City. Mr. Brout was formerly an Operations Research Analyst with United Aircraft Corporation.

**Douglas Y. Cornog** has accepted a position as Senior Engineer, Human Factors Group, in the Weapons Systems Engineering Department of the Westinghouse Air Arm Division, Baltimore, Maryland. He was formerly a graduate student at the University of Pennsylvania.

**Gertrude M. Cox** has resigned as Director, Institute of Statistics of The Consolidated University of North Carolina. She will continue for the present as Professor of Statistics at North Carolina State College. Dr. Cox assumed a new position as Head, Statistics Research Division, The Research Triangle Institute on January 1, 1959.

**Sid Damskey** is a Mathematician with Reliability Department 5660, Solid Rocket Plant, Aerojet-General Corporation, Sacramento, California. He will be assisting engineers with Applied Statistics.

**Louis I. Dublin** was awarded the American Public Health Association's Sedgwick Memorial Medal for "distinguished service in public health" at the 87th Annual Meeting of the American Public Health Association in Atlantic City. Dr. Dublin retired as Second Vice-President and Statistician of the Metropolitan Life Insurance Company in 1952 and since then has served as Consultant to the Institute of Life Insurance on community health and welfare activities.

**Anna Endelman**, formerly Analytical Statistician with the Bureau of Supplies and Accounts, Navy Department, has joined the staff of the Bureau of Old-Age and Survivors Insurance, Social Security Administration, as Mathematical Statistician, Statistics Branch, Division of Program Analysis.

**Charles Federspiel** has completed the requirements for the Ph.D. at North Carolina State College and has joined the faculty of the Vanderbilt University School of Medicine.

**Melvin D. Fimple** is a staff member of the Statistics and Evaluation Section, SANDIA Corporation, Albuquerque, New Mexico.

**Leo A. Goodman**, Professor of Statistics and Sociology at the University of Chicago, has been awarded a Senior Postdoctoral Fellowship by the National Science Foundation and a Fellowship by the John Simon Guggenheim Memorial Foundation; he is now at the Statistical Laboratory of the University of Cambridge, Cambridge, England, on leave of absence from the University of Chicago.

**Samuel P. Hayes** has been appointed Professor of Economics, half-time, at the University of Michigan, where he will help to formulate an expanded program of instruction, research and services in the economic development of underdeveloped countries. He will continue half-time as Director of the Foundation for Research on Human Behavior, Ann Arbor, Michigan.

**John M. Hilpert** is Associate Professor of Management Engineering, University of Alaska, College, Alaska.

**Theodore W. Horner** is now employed as Senior Statistician with Booz-Allen Applied Research, Inc., at Bethesda, Maryland. The position involves statistical research and consulting on industrial and governmental contracts.

**H. Burke Horton**, formerly Director of the Operations Research Office, Office of Civil and Defense Mobilization, has resigned from the government to join the staff of Sperry-Rand Corporation.

**Therese Kelleher**, Mathematical Statistician in the Statistical Standards Division, Agricultural Marketing Service, has resigned to join the Department of Genetics at North Carolina State College.

**Charles F. Keyes** is studying Anthropology in the Graduate School at Cornell University.

**Stanley Lebergott**, who has spent the past year on a Rockefeller Public Service Award, has returned to the Office of Statistical Standards, Bureau of the Budget.

**Peter A. LeGrand** has recently become a Research Statistician for the Food-Drug Index of A. C. Nielsen Company, Chicago, Illinois.

**Ruy C. B. Lourenco-Filho** has been appointed Professor of Economics and Statistics of the Escola de Engenharia (School of Engineering) at the Universidade de Minas Gerais, Belo Horizonte, Brazil.

**Isador Lubin** has been appointed Arthur T. Vanderbilt Professor of Public Affairs at Rutgers University for the academic year 1959-60.

**Harry E. McAllister** is on leave as Professor of Economics and Business at Washington State University, Pullman, Washington, for 1959-60. He will be at the National Bureau of Economic Research, New York City, and will serve as consultant to the Price Statistics Review Committee, which will undertake an examination and appraisal of Federal statistical programs dealing with prices and price indexes.

**Amos Monroe Moore's** new job is Assistant Professor of Statistics, College of Commerce, Louisiana State University, Baton Rouge, Louisiana.

**Joseph M. Moser** received his Ph.D. from St. Louis University, St. Louis, Missouri, in June, 1959, and is now Assistant Professor of Mathematics at San Diego State College, San Diego, California.

**Thomas F. Mosimann**, formerly Chief of the Branch of International Technical Cooperation, Bureau of Labor Statistics, has joined the staff of the Office of Statistical Standards, Bureau of the Budget. He will work primarily in the field of price statistics.

**Dorothy K. Newman**, formerly Assistant Chief of the Division of Construction Statistics, Bureau of Labor Statistics, has joined the staff of the Division of Prices and Cost of Living as Chief of the Branch of General Price Research and Publications. Mrs. Newman recently returned from Europe, where she was engaged in a part-time study for the Department of Labor of workers' housing, particularly in Great Britain.

**Carl E. Ortmeier**, formerly a Research Associate in the Department of Preventive Medicine and Public Health of the College of Medicine, Howard University, has joined the staff of the Marriage and Divorce Section of the National Office of Vital Statistics as Analytical Statistician.

**William S. Peters** is now Associate Professor, and Statistician for the Bureau of Business Service, Arizona State University, Tempe, Arizona. He was formerly at Montana State University.

**Theodore Pritzker**, formerly with the Children's Bureau, has joined the staff of the Mortality Analysis Section, National Office of Vital Statistics, to work in the area of perinatal mortality.

**Edward Rattner** is now Senior Program Management Specialist in the Plans and Programs Division of the Martin Company, Denver, Colorado. Until recently he was with the National Science Foundation.

**D. K. Ray-Chaudhuri** has been appointed Research Associate in the Statistical Laboratory of Case Institute of Technology, Cleveland, Ohio.

**Vergil D. Reed** will be in Sao Paulo, Brazil, for at least the next two years under the joint sponsorship of the International Cooperation Administration and Michigan State University. He will be Advisor and Consultant to Escola de Administracao de Empresas de Sao Paulo and will assist in establishing colleges of Business Administration in three other Brazilian universities.

**Donald Richter** has been appointed Assistant Professor of Statistics at the University of Minnesota, Minneapolis.

**Walter F. Ryan** has completed a two-year assignment in Manila with the United Nations Technical Assistance Program and has been appointed Deputy Chief of the Office of Statistical Standards, Bureau of the Budget.

**Aaron S. Sabghir**, who transferred earlier this year to the Office of Education, has returned to the Construction Industry Division, Business and Defense Services Ad-

ministration, as Senior Economist for the Division's new program of construction economics research and analysis.

**Jack Silber** has returned from Europe where he was Consultant to the Operations Analysis Office, Hq. United States Air Forces in Europe.

**Morris J. Solomon** has joined the staff of the International Statistical Programs Office, Bureau of the Census, as a Mathematical Statistical Advisor (sample surveys) and is assigned to Calcutta.

**Raymond J. Tassini** has changed his position from that of Project Engineer—Statistical Methods with the Light Military Electronics Department of General Electric to that of Reliability Analysis Engineer

with the General Engineering Laboratory serving the engineering sections of all General Electric Company departments.

**Andrew Ungar** is now Assistant Supervisor for the Operations Research and Statistics Group in the Computer Applications and Operations Research Section at the Armour Research Foundation of Illinois Institute of Technology. He was formerly an Operations Analyst in the same group. **W. G. Warren** is a graduate student working for the Ph.D. at the University of North Carolina. He plans to return to research in forest biometry on completion of the Ph.D. program.

**Francis Joseph Weiss**, Scientific Consultant on Food and Nutrition, joined the

staff of the Science and Technology Division of the Library of Congress as Foreign Research Analyst. Dr. Weiss will review foreign literature in certain fields of physical and biological sciences and report on developments in these fields.

**Irving Weiss** has returned to his position as Assistant Chief (Processing) of the Economic Operations Division, Bureau of the Census, after acting as Chief of the Economic Census Branch in Jeffersonville, Indiana, for a year and a half.

**Raymond L. Wilder** has been transferred to a field assignment with the Operations Research Group of the Electrochemicals Department of DuPont at Niagara Falls.

---

**Edwin J. de Beer** died in Bronxville, N. Y. on October 27 at the age of 57. Born in Portsmouth, Ohio, Dr. de Beer graduated from the University of Pennsylvania in 1925, receiving an M.S. there in 1927 and a Ph.D. in biological chemistry in 1932. He became a chemist for Burroughs, Wellcome & Co., Inc., drugs and pharmaceuticals, in 1933 and at his death was Associate Director of Research and head of the Department of Pharmacodynamics for the firm. Dr. de Beer was internationally known in the field of pharmacology, particularly for his work in the application of statistics to biological experimentation. He was one of the founders of the Biometric Society, a Fellow of the American Association for the Advancement of Science, and a member of the ASA and other scientific or professional societies.

---

## CHAPTER NOTES

### Buffalo-Niagara

Dr. Norman C. Severo, Associate Professor of Mathematical Statistics, University of Buffalo, spoke on "Mechanization of the Post Office" at the October 12th meeting of the Buffalo-Niagara Chapter.

Dr. Severo discussed statistical studies carried out by the National Bureau of Standards for the Post Office Department in order to determine how the mechanization of certain sorting and routing procedures could most efficiently be carried out. These studies involved the sampling of mail flow at various times to obtain estimates of such variables as the percentage of mail flowing from a given point to another given point, and the physical dimensions of various types of mail. Dr. Severo described a multi-stage sampling scheme which would allow precise estimates of small percentages in such a way as to effect a minimum disturbance in the flow of outgoing mail.

The discussion following the talk centered around some of the practical difficulties involved in effecting mechanical changes in an organization as complex as the U. S. Post Office.

The Chapter's program for the remainder of the 1959-60 year is as follows:

November 16, 1959—Tests of Causation—Dr. Paul R. Sheeche, Roswell Park Memorial Institute.

January 11, 1960—Some Theory of Simultaneous Equation Control Systems with Econometric and Industrial Application—Mr. Wade Sewell, Cornell Aeronautical Laboratories.

February 1, 1960—Response Surface Methodology (Joint Meeting with Buffalo Section American Society for Quality Control)—Dr. G. E. P. Box, University of Wisconsin.

February 29, 1960—A Statistical Approach to Public Problems: Application to

Auto Crash Injuries—Dr. Irwin D. Bross, Roswell Park Memorial Institute.

March 14, 1960—Management's Achilles' Heel: Inadequate Data, Erroneous Impressions, Costly Mistakes—Dr. Rensis Likert, President A.S.A., and University of Michigan.

April 11, 1960—Statistical Aspects of Epidemiological Studies—Dr. Morton L. Levin, Roswell Park Memorial Institute.

### Central New Jersey

The speaker at the October 27th meeting was Harlan Mills, President of Mathematica. Dr. Mills' subject was "Statistical Smoothing in Inventory Processes."

### Chicago

A joint luncheon meeting with the Chicago Chapter of the American Marketing Association was held on October 20th, at which Dr. Donald Campbell, Professor of Psychology at Northwestern University spoke on "Experimental Design as a Statistical Tool." Dr. Campbell discussed twelve critical sources of invalidity in the design of field experiments.

The first dinner meeting of the 1959-60 year was held the evening of November 5th. Mr. D. S. Warning, Director of Marketing Research, Standard Oil Company of Indiana, spoke on "The Outlook for Petroleum." Mr. Warning discussed what must be done to correct the problems with which the industry is plagued—large inventories, weak prices, import restrictions and static demand.

The luncheon meeting schedule for the remainder of the 1959-60 year is as follows:

November 17—Herbert Horwich, "Statistical Techniques in Stock Market Analysis."

December 15—Ezra Solomon, "The Economic Profile of Chicago."

January 7—(joint with AMA)—Philip Hauser (subject to be announced).

January 19—Speaker to be announced.

February 16—Speaker to be announced. March 3—(joint with AMA)—Robert Eggert, "Advertising Research—Good or Bad?"

March 15—Speaker to be announced. April 7—(joint with AMA)—Russell, "The Impact of the St. Lawrence Seaway." April 20—Speaker to be announced. May 17—Speaker to be announced.

### Cincinnati

At the June meeting of the Chapter, the following officers were elected for the 1959-60 year:

President — DR. RAM GNANADESIKAN, Procter and Gamble Co.

Vice-President—DR. CARL SMITH, Institute of Medical Research, Christ Hospital.

Treasurer—DR. CHARLES D. STEVENS, Kettering Laboratory.

Secretary—JAMES J. TUMBUSCH, Testing Operation, F.P.L.D., General Electric Co.

The speaker at this meeting was Dr. McCormick of the U.S. Public Health Service, whose subject was "Spectral-analysis of Stationary Time Series."

At the July meeting Dr. D. Wallace, Visiting Professor, University of Cincinnati, spoke on "Conditional Confidence Level Properties."

### Colorado-Wyoming

New officers were elected at the June meeting of the Chapter. They are:

President—PEARL A. VAN NATTA, Child Research Council, School of Medicine, University of Colorado, Denver.

Vice-President—JAMES A. NIEDERJOHN, Ideal Cement Co., Denver.

Secretary—DONALD N. LIVINGSTON, 1644 South Ivy Way, Denver.

Treasurer—ANNE SISTRICK, U. S. Air Force Accounting and Finance Center, Denver.



The 1959-60 season began with a meeting on September 23rd devoted to planning the Chapter activities for the year ahead. The following two motions were unanimously approved:

1) "that the Program Committee act as it sees fit to solicit statistical problems and have them discussed as part of the regular meetings. These could be problems of ethics, or problems of the relationship between statistician and staff, as well as technical problems."

2) "that the Chapter establish a Speakers' Committee with the aim of providing speakers for high schools on Career Day and for the programs of various community organizations; and that when this is accomplished that we send letters to the high schools informing them of our availability."

The November 18 evening meeting began with a 45-minute "Problem Clinic" which was followed by a discussion led by Mr. Charles A. Roumasset, Acting Regional Director of the Bureau of Labor Statistics from San Francisco, who spoke on 1) interesting aspects of our regional economy, 2) future plans of the Bureau, 3) problems of construction of several BLS series.

#### Detroit

"Potentials and Pitfalls in Metropolitan Growth" was the subject of a talk by Paul M. Reid, Executive Director, Detroit Metropolitan Area Planning Commission, at the dinner meeting of October 13th. John Stewart, Research Director, Detroit Board of Commerce, was the guest chairman.

#### New York

The subject of the meeting on October 1st was "Some Applications of Stochastic Processes to Industrial Problems." Nathan Morrison, N. Y. State Employment Service, was chairman, and the speakers were Roger Wilkinson, Bell Telephone Laboratories, and Professor Cyrus Derman, Department of Industrial Engineering, Columbia University.

A dinner meeting was held October 22nd at which the topic discussed was "Productivity Trends in the United States." The speakers were Solomon Fabricant, Professor of Economics, New York University, and Director of Research, National Bureau of Economic Research; and Ewan Clague, Commissioner of Labor Statistics, U. S. Department of Labor. Norris O. Johnson, Vice President, and Robert E. Lewis, Associate Economist, First National City Bank of New York, were co-chairmen.

The New York Chapter is cooperating with the Professional Placement Center of

the New York State Employment Service in establishing a specialized placement service for statisticians and economists.

#### Pittsburgh

Officers of the Chapter for 1959-60 are:

President—HERB GINSBURG, Westinghouse Electric Corporation.

Vice President—PHILIP HERMAN, Jones & Laughlin Steel Corporation.

Secretary—ISADORE ALTMAN, University of Pittsburgh.

Treasurer—THOMAS ELKINS, Gulf Research and Development Co.

#### Rochester

On Tuesday evening, October 13, 1959, the Chapter held its first meeting of the year in the conference room of the Rochester Industrial Management Council. The speaker for the evening was Dr. Richard Lewontin, Associate Professor of Biology at the University of Rochester. His topic was "A Monte Carlo Analysis of a Problem in Natural Selection."

Dr. Lewontin first outlined the formalism of genetics and discussed the relative probabilities of homozygotes and heterozygotes. He likened the problem faced by the geneticist to that of a one-dimensional random walk with two absorbing barriers and a drift tendency.

Dr. Lewontin then outlined a genetic model of a mouse population which he had constructed to study the change in the gene population. He had used an IBM 650 computer to conduct his analysis using Monte Carlo principles. Essentially what was done was to keep changing the parameters of the problem and then analysing the variance in order to arrive at a conclusion. The Monte Carlo analysis worked particularly well in this case since the mouse population is composed of a number of tightly-knit families which are quite well separated from one another. This means that there is no large universal population. Because of the small population and its isolation, the Monte Carlo method of analysis in this particular case yielded much more reasonable results than an algebraic solution. Dr. Lewontin described his procedure as a mathematical model of an evolutionary process.

At the conclusion of the meeting, the Chapter President, Dr. Lionel McKenzie, Chairman of the Department of Economics at the University of Rochester, commented briefly on the application of Dr. Lewontin's methods to the field of Economics.

#### St. Louis

At the October 15th meeting Mr. Stephen Best, Research Director of the St. Louis

County Juvenile Court, spoke on "Juvenile Delinquency—Some Statistical Implications." Mr. Best discussed some experiences that local and Federal agencies have had in collecting statistics on delinquency, as well as analyses that have been made of delinquency data.

#### San Francisco

Lawrence R. Klein, Editor-in-Chief of the Bureau of Labor Statistics' *Monthly Labor Review*, was the speaker at the September 16th meeting of the San Francisco Chapter of the American Statistical Association. Mr. Klein's topic was "Editing a Professional Journal—Writing Without Fun or Profit." The talk was a challenging discussion of the current state of economic and statistical writing (bad) and the roles of the editor and author in improving its quality. Decrying the "compulsion to publish," Mr. Klein argued that the need was for fewer rather than more professional journals, and called for the elimination of cant and jargon and the return to simplicity and directness in writing. Mr. Klein's talk was illustrated by excerpts from manuscripts submitted to the *Monthly Labor Review* and articles published in other professional journals.

#### Southern California

At its October 29th meeting the Chapter heard two speakers on the topic, "The Role of Statistics in Rocketdyne Operation." They were Mr. Paul E. Murphy, Chief of Industrial Planning, Rocketdyne, and Mr. Allan H. Whytock, Staff Assistant and a member of the plant engineering staff.

A Business Index Committee has been established by the Chapter to study the development of regional indicators for use in Southern California. The Chairman of the Committee is Dr. Park Ewart.

#### Washington

A meeting on the subject, "The Role of Statistics in Space Technology" was held on October 28th. The speakers were R. O. Belsheim, Mechanics Division, Naval Research Laboratory, who discussed "The Organization of a Testing Program for Rocket-Borne Equipment"; and Nicholas E. Golovin, Director, Technical Operations Division, Advanced Research Projects Agency, who spoke on "The Prediction of the Reliability of Complex Systems." Homer E. Newell, Jr., Assistant Director for Space Sciences, National Aeronautics and Space Administration, was chairman.

Future Annual Meetings of ASA are as follows:

<u>YEAR</u>	<u>PLACE</u>	<u>HEADQUARTERS</u>	<u>DATES</u>
1960	PALO ALTO, CALIF.	STANFORD UNIVERSITY	AUGUST 23-26
1961	NEW YORK CITY	ROOSEVELT HOTEL	DECEMBER 27-30
1962	MINNEAPOLIS	LEAMINGTON HOTEL	EARLY SEPTEMBER
1963	CLEVELAND	CASE INST. OF TECH. AND WESTERN RESERVE UNIV.	EARLY SEPTEMBER

# TECHNOMETRICS

*A Journal of Statistics for the Physical, Chemical and Engineering Sciences*

## VOLUME 1, NUMBER 1

FEBRUARY, 1959

- Response Surface Designs for Three Factors at Three Levels—*R. DeBaun*  
Some Statistical Aspects of the Economics of Analytical Testing—*O. L. Davies*  
A Quick Compact Two Sample Test of Duckworth's Specifications—*J. W. Tukey*  
The Analysis of Life Test Data—*R. L. Plackett*  
Mathematical Probability in the Natural Sciences—*R. A. Fisher*  
Partial Duplication of Factorial Experiments—*O. Dykstra*  
Condensed Calculations for Evolutionary Operation Programs—*G. E. P. Box and J. S. Hunter*
- 

## VOLUME 1, NUMBER 2

MAY, 1959

- Measurements Made by Matching with Known Standards—*W. J. Youden, W. S. Connor and N. C. Severo*  
Random Balance Experimentation—*F. E. Satterthwaite*  
The Application of Random Balance Designs—*T. A. Budne*  
Discussion of the Papers of Messrs. Satterthwaite and Budne — *W. J. Youden, Oscar Kempthorne, J. W. Tukey, G. E. P. Box and J. S. Hunter*  
Quick Analysis Methods for Random Balance Screening Experiments—*F. J. Anscombe*
- 

## VOLUME 1, NUMBER 3

AUGUST, 1959

- Simplified Estimators for the Normal Distribution when Samples are Singly Censored or Truncated—*A. Clifford Cohen, Jr.*  
Control Chart Tests Based on Geometric Moving Averages—*S. W. Roberts*  
The Measuring Process—*John Mandel*  
Factorial Experiments in Life Testing—*Marvin Zelen*  
The Use of LaGrange Multipliers with Response Surfaces—*A. W. Umland and W. N. Smith*  
A Statistical Model for Evaluating the Reliability of Safety Systems for Plants Manufacturing Hazardous Products—*Louis B. Kahn*
- 

## VOLUME 1, NUMBER 4

NOVEMBER, 1959

- Quality Control Methods for Several Related Variables—*J. Edward Jackson*  
Analysis of Latin Squares within Certain Type of Row-Column Interaction—*John Mandel*  
A Graphical Estimation of Mixed Weibull Parameters in Life Testing Electron Tubes—*John H. K. Kao*  
Evaluation of Chemical Analyses on Two Rocks—*W. J. Youden*  
Use of Half-Normal Plots in Interpreting Factorial Two Level Experiments—*Cuthbert Daniel*  
On the Analysis of Factorial Experiments without Replication—*Allan Birnbaum*

\$6.00 per year for members; \$8.00 for non-members. Send your order and remittance to:

**TECHNOMETRICS — American Statistical Association**

404 Beacon Bldg.

1757 K Street N.W.

Washington 6, D. C.

Our thanks for this new project go to the following: The American Society for Quality Control, for its interest and support in starting this new publication jointly with ASA. If not unique, it is unusual for two societies to place their combined efforts behind a single publication such as this. Eugene Fisher, President of ASQC, and Walter Hoadley, then President of ASA, were the officers who negotiated this cooperative enterprise. The Editor, J. Stuart Hunter and his associate editors, deserve our appreciation for their splendid performance. The fact that *TECHNOMETRICS* has done so well is certainly a tribute to the editorial board. Thirdly, the *TECHNOMETRICS* Management Committee, under the chairmanship of Paul Olmstead, should have the recognition that comes from a job well done. While the Committee, which consists of three representatives from each society, in addition to Mr. Olmstead, will continue to have the responsibility of guiding the magazine, the most difficult part of the Committee's labor has been accomplished: the actual launching of the magazine and the appearance of its first numbers. To all of the foregoing I am sure that the association joins me in expressing our genuine appreciation.

Switching now to a different kind of activity, we come to the program for obtaining new members. For the sake of clarity let me divide this into two parts: one, the institutional membership program, and two, promotion for new individual members. The institutional membership program is one of long standing. While the dues received from the institutional members help support the Association's publications and activities, more important perhaps is the realization by these organizations, of the importance of statistics to their own internal programs. This growing realization is graphically shown by the increase in the number of institutional members from half a dozen about ten years ago, to approximately forty today. However, even this number is far from representative of the corporations and other organizations who have a stake in the development of statistical theory and applications.

The Institutional Membership Committee under the chairmanship of Ralph E. Burgess is in process of preparing a special brochure for distribution to potential members. The text of the brochure was authored by Walter E. Hoadley, the Immediate Past President of ASA and Treasurer of the Armstrong Cork Company. The Institutional Membership Committee has written to each chapter requesting that a local chairman for institutional membership be appointed. For each new institutional member obtained by the local chapter \$25.00 will be remitted to the chapter Treasurer from the first year's dues payment.

We hope that all members of the Association will join in this program to obtain new institutional members. Those of you whose companies do not now hold institutional membership in ASA are especially urged to suggest this form of support to the appropriate person. The

Committee will be delighted to supply complete details and forms upon request. You should also contact your local chapter President and Secretary to indicate to them any way in which you would like to help this program. Your cooperation will be greatly appreciated.

Another aspect of the membership program is that of inviting persons interested in statistics to join the Association. While 1959 will be among the best, if not the best, year in terms of the number of new members joining ASA, there is still much to be done. The many new members joining ASA are indicative of the wide spread of statistics, but it is estimated that for every person holding membership in the Association, there is another potential member who has not yet joined. Thus, if we were able to reach these persons who are interested in the application of statistics or the development of statistical theory, we could double the size of the Association. Even this would not bring the Association to its limits, since statistics seems to be on a threshold of new developments that will continue the steady expansion begun more than a century ago. The increased use of statistics in auditing and other accounting procedures, the use of statistics in space research, in chemical methods and other fields of engineering are a few examples of newer developments. The National Office of the Association sends an invitation and information about ASA to the members of other societies on a regular basis. However, if you think of a particular group whose members would be interested in knowing more about the Association, we would appreciate hearing from you. Let us know to whom we should write for permission to use the mailing list. Any other suggestions you have, of course, will be most welcome.

Finally, a word concerning the non-periodical publications of the Association. As you know, *Proceedings* are published for the Business and Economics Statistics Section and the Social Statistics Section. The Board authorized publication of these volumes at the request of the respective sections. Section members who are interested should support the continuation of these volumes in the most practical manner possible: by buying copies as the new editions are published. The prices of both *Proceedings* have been set at a minimum. The *Proceedings* published last year and this sold out relatively quickly and this may indicate the need for a larger printing in the future.

As usual the report of the Board of Directors and the Secretary-Treasurer for 1959 will contain details about all the Association's activities and accomplishments for the full year. These will be reported at the meeting of the Board and Council during the Annual Meeting of the Association in Washington and then printed in full in the June 1960 issue of the *JOURNAL* of ASA.

I wish to thank the membership for their support during the past year and to extend an invitation to write whenever you have suggestions or queries. The officers of the Association and the staff at the National Office will appreciate hearing from you.



